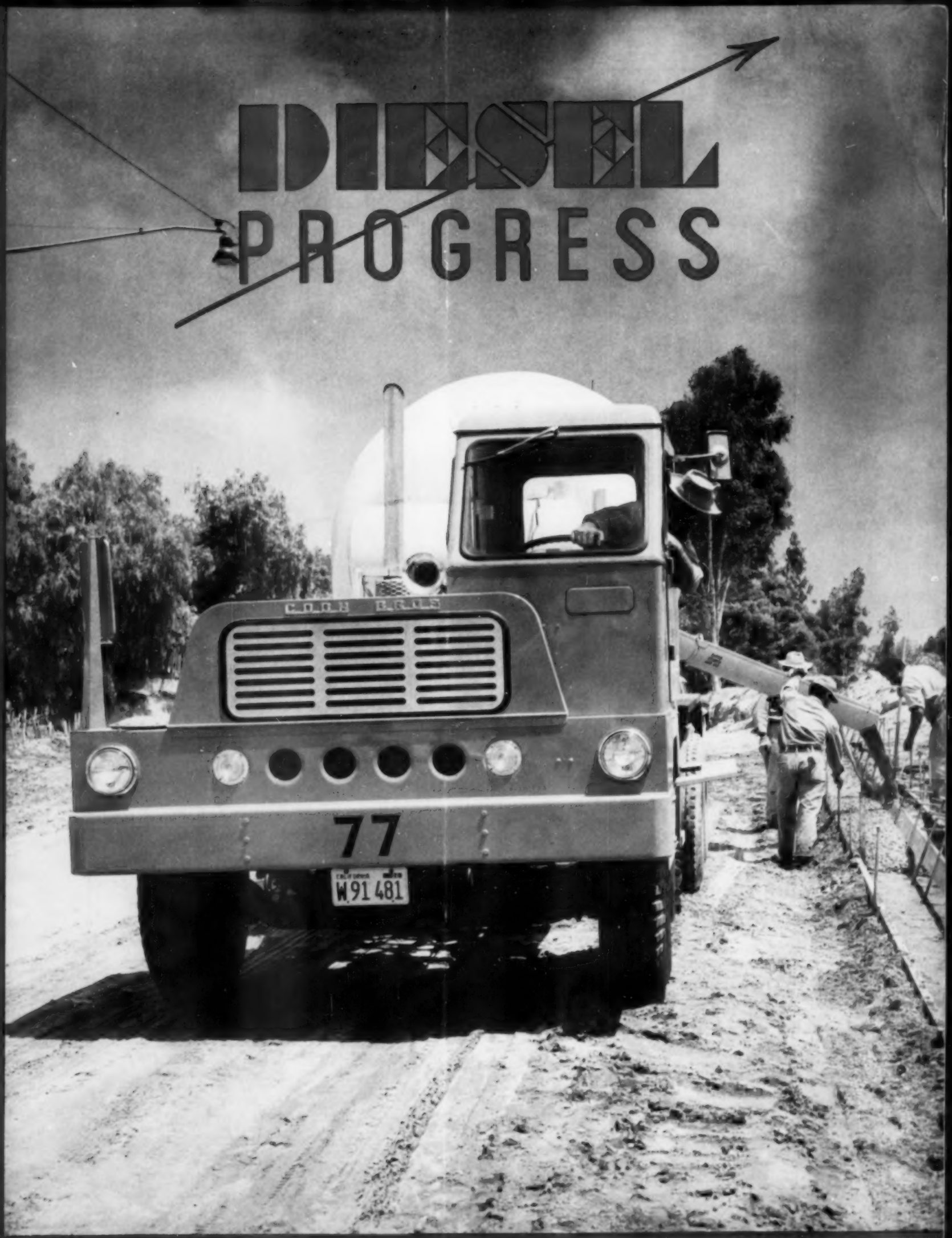
DIESEL PROGRESS

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR



FIVE DOLLARS PER YEAR

NOVEMBER, 1956

FIFTY CENTS PER COPY

TEXACO

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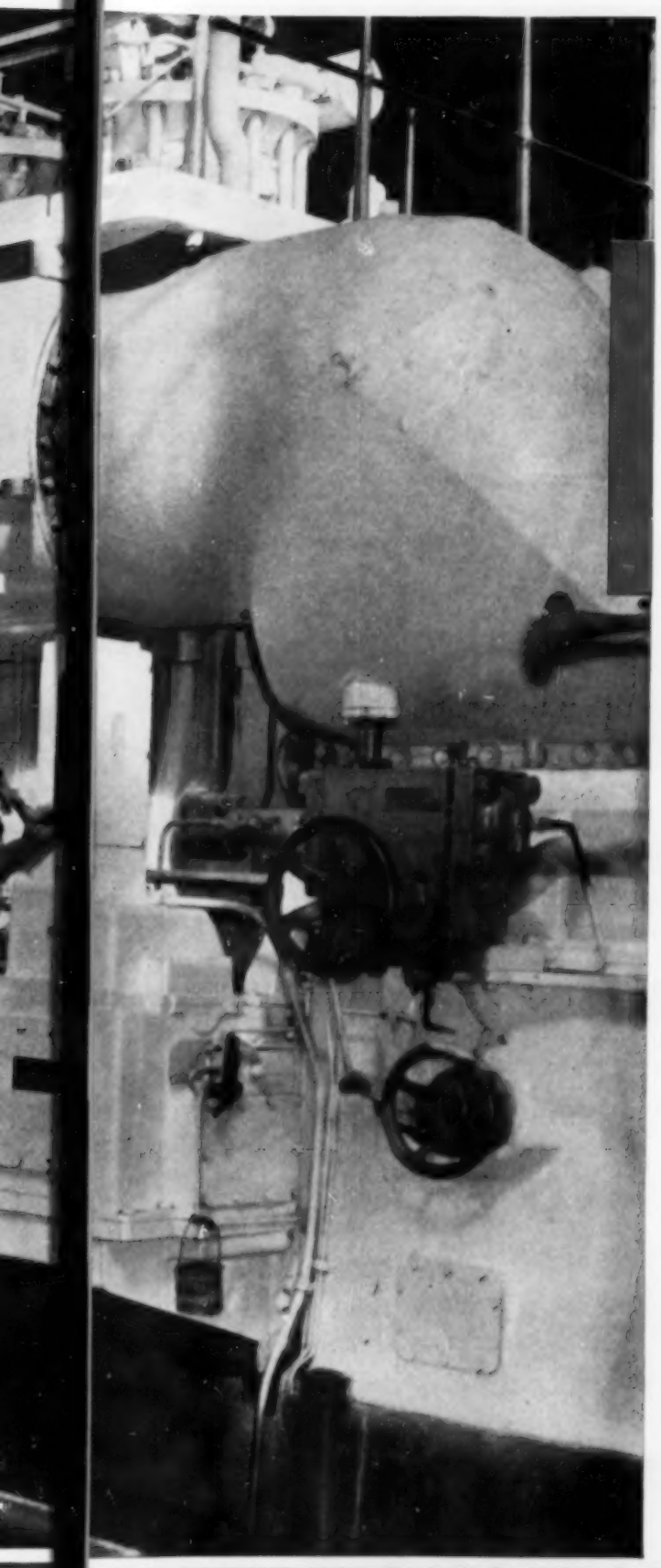

Raise power output... Reduce costs

It can be done... when you change the lubricant in your engines to one of the famous *Texaco Ursa Oils*. Because *Texaco Ursa Oils* prevent harmful engine deposits, keep rings and valves free for full compression and combustion—you'll see power output go up, kwh costs come down.

There is a complete line of *Texaco Ursa Oils*—especially refined to assure *more power* with *less fuel* over *longer periods* between overhauls—from diesel, gas or dual-fuel engines.

This is no idle claim. It's backed by the fact that—

For over 20 years, more stationary diesel h.p. in the U.S. has been lubricated with Texaco than with any other brand.

Get in touch with a Texaco Lubrication Engineer soon. With his help in selecting the right *Texaco Ursa Oil* for your needs, you'll get a head start toward greater efficiency, lower costs.

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

URSA OILS FOR ALL DIESEL, GAS AND DUAL-FUEL ENGINES

Harrison Oil Coolers Take the Heat off Heavy-Duty Diesels!

Heat abandons ship . . . when Harrison's aboard! With a payload of 30 tons of halibut, it takes a mighty Detroit Diesel engine to power this fishing boat. And it takes a Harrison oil cooler to do the cooling job *and do it right!*

HARRISON KEEPS THIS TRAWLER COOL!

In fact, you'll find Harrison heat exchangers *in every line of industry . . . in every line of defense!* That's because you can depend on Harrison, with over 46 years' experience in design, research and manufacture, for top-quality heat-control products. If you have a cooling problem, look to Harrison for the answer.

HARRISON RADIATOR DIVISION,
GENERAL MOTORS CORP., LOCKPORT, N. Y.

TEMPERATURES MADE TO ORDER

GM GENERAL MOTORS

Watch "WIDE, WIDE WORLD" Sundays on NBC-TV

HARRISON

DIESEL and GAS ENGINE PROGRESS

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FRONT COVER ILLUSTRATION

Providing proportion to deliver ready mixed concrete for rapidly growing Southern Calif., like is one of the newer fields invaded by diesels. This unit, belonging to San Diego Transit Mixed Concrete Co., is shown pouring a slab in a suburban area.

Why this *new* AMP-PAK Packaged Generator?...10 BIG ADVANTAGES FOR YOU

1 LICKS THE MAINTENANCE PROBLEM — no moving parts in the excitation or regulation systems . . . no tubes, no rotating parts, no vibrating contacts.

2 SIMPLE OPERATION — no belts, no "tricky" commutator, no adjustments — anyone can operate AMP-PAK.

3 MAGNETIC AMPLIFIER "MAGIC" — regulates voltage — unique voltage sensing circuit keeps voltage "on the beam".

4 "ROCK-STEADY" VOLTAGE — makes your motors, lights, and electronic equipment work better.

5 STARTS BIG MOTORS — built-in voltage booster transformer leaps into action to maintain voltage level!

6 POSITIVE VOLTAGE CONTROL — easily set to compensate for line voltage drop.

7 NEW, HEAVY-DUTY FRAME — keeps AMP-PAK's interior safe, clean, and dry.

8 SIMPLE INSTALLATION — AMP-PAK is self-contained and factory assembled. Large, one-piece foot simplifies alignment . . . is universally adaptable to mounting requirements.

9 NEW, EASY-TO-READ METERS — no need to stoop. Each meter floats in a ring of live rubber.

10 TOP QUALITY PERFORMANCE is built into every AMP-PAK. Backed by more than 50 years' engineering experience of the country's largest manufacturer of Packaged Generators.

Generator: AMP-PAK...

HAS NO REVOLVING EXCITER, NO MOVING PARTS IN THE VOLTAGE REGULATOR!

Ratings — 75 thru 187 kva at 1800 rpm and 62½ thru 187 kva at 1200 rpm; 3 phase; 80% PF; 60 cycles; 50 C rise; 120/208, 240, 480, and 600 volts

Completely New DESIGN TO GIVE YOU...

a compact, revolving field A-C Generator with built-in static excitation system; static voltage regulator; and basic metering and controls conveniently grouped. AMP-PAK is a portable unit – factory assembled, internally connected, and tested. It features:

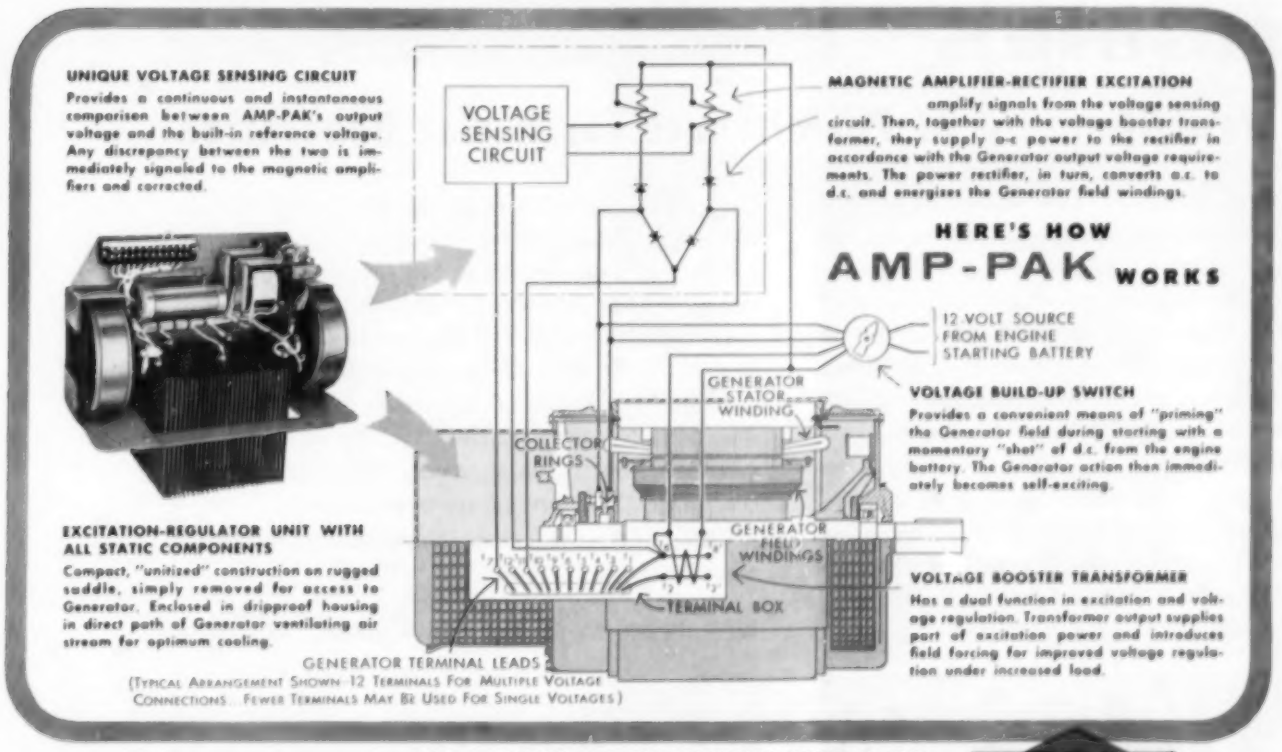
1. SIMPLIFIED EXCITATION SYSTEM — a heavy-duty, long-life static rectifier and magnetic amplifier replace the old-fashioned type exciter with its commutator, brushes, and rotating parts.

2. RELIABLE VOLTAGE REGULATOR — requires no attention or adjustment. You simply select output voltage (within generator rating) and the regulator keeps the voltage within ±2% of the initial setting.

3. VOLTAGE BOOSTER TRANSFORMER — stands by with high speed, reserve power to instantly bolster line voltage by "field forcing" when heavy loads are suddenly applied.

4. PRACTICALLY MAINTENANCE-FREE SERVICE — no vacuum tubes, no vibrating contacts . . . in fact, no moving parts in the entire excitation and regulation systems. The control requires only occasional inspection for general cleanliness.

5. SIMPLE OPERATION WITHOUT SWITCHBOARD — you simply connect the load to the Generator thru a suitable line switch.


UNIQUE VOLTAGE SENSING CIRCUIT
Provides a continuous and instantaneous comparison between AMP-PAK's output voltage and the built-in reference voltage. Any discrepancy between the two is immediately signaled to the magnetic amplifiers and corrected.
VOLTAGE SENSING CIRCUIT
MAGNETIC AMPLIFIER-RECTIFIER EXCITATION
amplify signals from the voltage sensing circuit. Then, together with the voltage booster transformer, they supply a-c power to the rectifier in accordance with the Generator output voltage requirements. The power rectifier, in turn, converts a.c. to d.c. and energizes the Generator field windings.
HERE'S HOW
AMP-PAK WORKS
12 VOLT SOURCE FROM ENGINE STARTING BATTERY
VOLTAGE BUILD-UP SWITCH
Provides a convenient means of "priming" the Generator field during starting with a momentary "shot" of d.c. from the engine battery. The Generator action then immediately becomes self-exciting.
GENERATOR STATOR WINDING
COLLECTOR RINGS
GENERATOR FIELD WINDINGS
TERMINAL BOX
VOLTAGE BOOSTER TRANSFORMER
Has a dual function in excitation and voltage regulation. Transformer output supplies part of excitation power and introduces field forcing for improved voltage regulation under increased load.
EXCITATION-REGULATOR UNIT WITH ALL STATIC COMPONENTS
Compact, "unitized" construction on rugged saddle, simply removed for access to Generator. Enclosed in drippproof housing in direct path of Generator ventilating air stream for optimum cooling.
GENERATOR TERMINAL LEADS
(Typical Arrangement Shown–12 Terminals For Multiple Voltage Connections...Fewer Terminals May Be Used For Single Voltages)

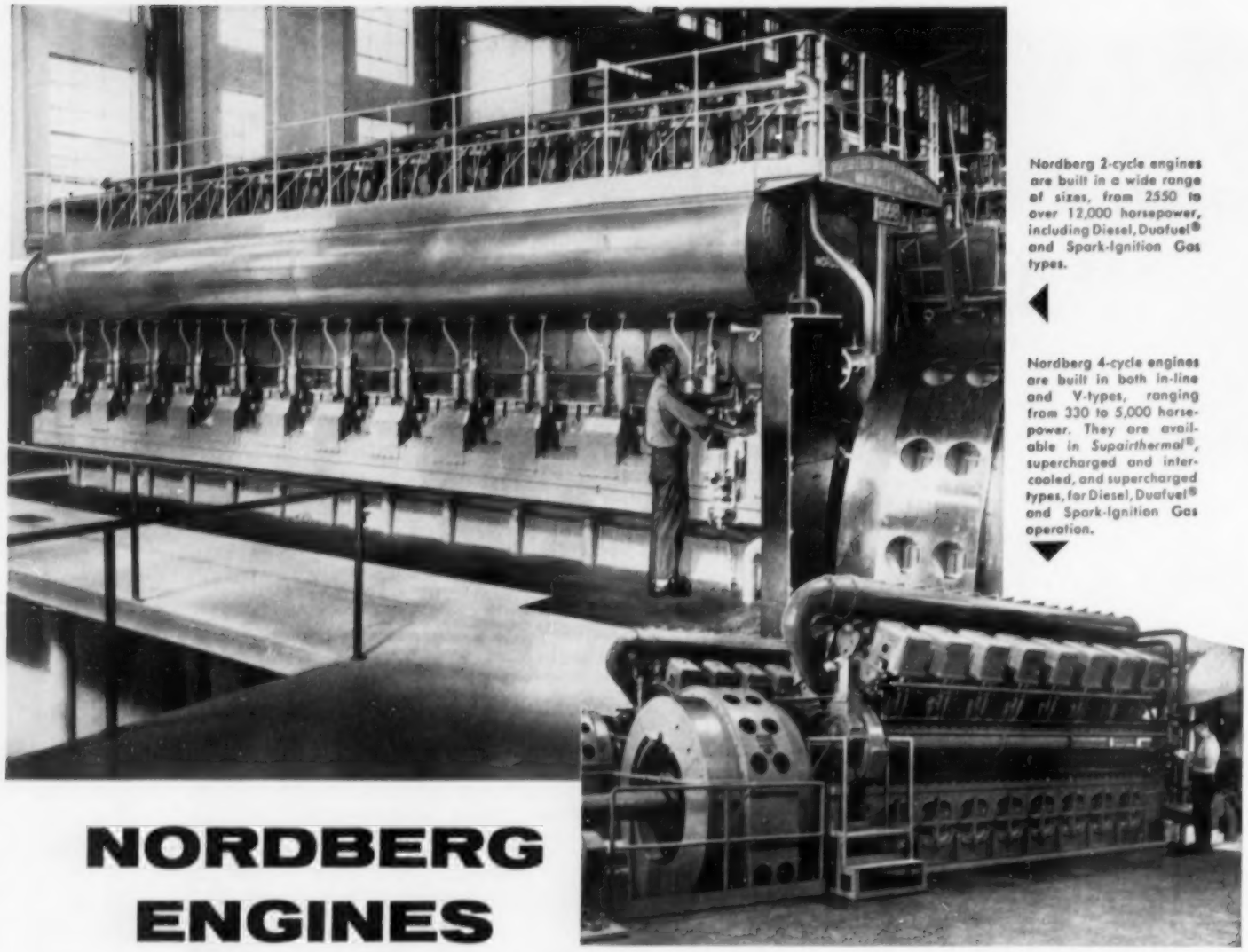
Got a generator problem? SEE YOUR NEAREST E-M SALES ENGINEER, OR WRITE THE FACTORY FOR "CUSTOMIZED" APPLICATION SERVICE.

Originators OF THE "PACKAGED" LINE OF A-C GENERATORS

ELECTRIC MACHINERY MFG. COMPANY
Minneapolis 13, Minnesota

E-M

2100-TPA-5100



Nordberg 2-cycle engines are built in a wide range of sizes, from 2550 to over 12,000 horsepower, including Diesel, Duafuel® and Spark-Ignition Gas types.

Nordberg 4-cycle engines are built in both in-line and V-types, ranging from 330 to 5,000 horsepower. They are available in *Supairthermal®*, supercharged and intercooled, and supercharged types, for Diesel, Duafuel® and Spark-Ignition Gas operation.

NORDBERG ENGINES

Set a *New Standard of Performance* for Power Generation

NORDBERG has an enviable record of more than forty years of specialized experience in the field of heavy duty internal combustion engine design and manufacturing. The purchase of Busch-Sulzer Bros. Diesel Engine Company in 1946 brought together two of America's outstanding Diesel builders . . . Nordberg, leader in the large engine field, and Busch-Sulzer, builder of the first successful Diesel to go into regular commercial service in 1898.

Always alert to the ever-increasing demand for better, more efficient and dependable prime movers, Nordberg has continually designed and built the finest engines that modern technical knowledge, facilities and experience could produce.

This unsurpassed combination has proved, through thousands of installations throughout the world, that Nordberg Engines have set, and are continuing to set, new standards of performance for efficient, reliable, low cost power generation . . . for both base load and standby power in public and private utilities, and for industry at large.

Backed by this broad experience and proved performance, Nordberg Engines are, by all standards, your best investment in modern prime movers for economical, long term power generation.

Write for further information, outlining your power requirements.

NORDBERG MFG. CO., Milwaukee, Wisconsin

NORDBERG
DIESEL • DUAFUEL® AND SPARK-IGNITION GAS ENGINES

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. . . builders of America's Largest Line of Heavy Duty Engines — 10 to over 12,000 horsepower

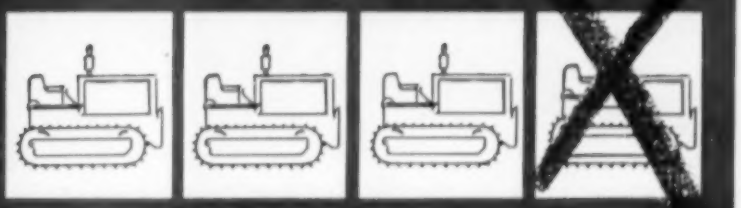
6 reasons for a torque converter in crawler tractors

For higher work output . . . and longer equipment life, more and more contractors are ordering their crawler tractors equipped with torque converter drive.

A torque converter offers six profitable, proved advantages applicable to *your* crawler tractors. 1. Multiplies torque *exactly* as needed (three-stage units up to 6:1). 2. Engines work up in the maximum efficiency range all the time, delivering constant high horsepower output . . . doing more work than units equipped with mechanical drive. 3. Power is matched to load demands automatically, with gear shifting minimized or eliminated—where mechanical transmissions must *stay* in the starting gear ratio, even after starting load resistance is reduced . . . operator efficiency is boosted. 4. Heavy load pick-up is smooth, even, without clutch slippage . . . better flotation is obtained. 5. Overloads, shock loads and vibrations are cushioned *out*, through *fluid* connection . . . providing longer tractor life with less maintenance. 6. Infinite variety of ratios is available to work with, permitting smooth, accurate control of loads and delicate "inching" under power.

For these reasons, today, the four manufacturers of the most powerful crawler tractors available have torque converter drive models. Of these, *all three of the "Big 3" volume producers*—Allis-Chalmers, Caterpillar and International—have designed special torque converter transmissions, in which they have standardized on Twin Disc Torque Converter Components. In each instance, Twin Disc Engineers worked closely with the manufacturer to aid in developing this complete torque converter power package to individually suit each crawler tractor's particular characteristics.

With men who know converters best...it's Twin Disc 3 to 1!



For years, the construction industry has been the "proving ground" for heavy equipment. And the *toughest* jobs, under the severest conditions, have constantly been assigned to crawler tractors. That's why men who built and used crawlers were among the first to recognize the advantages of torque converter drive . . . and *are* the men who know converters best.

Today, the four manufacturers of the most powerful crawler tractors available all have torque converter equipped models. Of these, *all three of the "Big 3" volume producers*—Allis-Chalmers, Caterpillar and International Harvester—have special torque converter transmissions, in which they *standardize* on Twin Disc Torque Converter Components.

TWIN DISC

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois
Branches or Sales Engineering Offices: Cleveland • Dallas • Detroit • Los Angeles • Newark • New Orleans • Tulsa

The Engineer's Field Report

CASE HISTORY

PRODUCT Chevron Starting Fluid

FIRM Great Northern Railway Havre, Montana

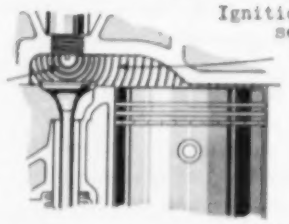
Special fluid starts 250-ton crane instantly, saves time in emergencies—even at 50° below

GREAT NORTHERN RAILWAY'S 250-TON, RAILROAD CRANE (above) starts instantly with Chevron Starting Fluid in temperatures ranging to 50° below zero—even after standing idle for months at a time. Former steam-powered wrecker equipment took crew 12 hours to start. This crane with its two 174 h.p. Cummins diesel engines is now available for derailment emergencies on short notice.

"Slow-grind starts on battery power alone waste too much valuable time. Chevron Starting Fluid fires these engines 'right now'—in any weather." A Great Northern engineer shows how simple it is to insert 7CC gelatin capsule of Chevron Starting Fluid in unit's air-intake system. Fluid is also available in 17CC capsules and 1-pint cans.

Why Chevron Starting Fluid starts engines instantly

Highly volatile: 7 times more than gasoline



Ignition temperature several hundred degrees lower than diesel fuel

Contains wear-reducing lubricants

Additives inhibit ice formation

CHEVRON STARTING FLUID

FREE FOLDERS tell more about the Chevron Starting Fluid and Chevron Pressure Primer System. Write or ask for them.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies listed below.

TRADEMARKS "CHEVRON" AND DESIGN REG. U. S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

DESIGNER...MANUFACTURER...USER

here's why it'll pay you to specify

International® Power Units

DESIGNER

Your problems of engine power analysis, selection, and installation are simplified when you specify International power for your equipment. International's complete and experienced staff of manufacturer sales representatives, and sales and design engineers supply you with engine dimensional drawings, accurate power curves, and complete specifications. They also help you select the International engine best suited to your particular power, torque, and rpm requirements, and adapt International engines for your tough special applications.

MANUFACTURER

International engineering service can help you cut manufacturing costs, speed up production by showing you the best way to mount International engines in your equipment. Pilot engine models, for your research, production, and testing purposes are also available. In addition, you stand a better chance to sell more of your machines when you offer the buyer International engines as standard or optional equipment. Yes, International engines in the equipment you sell, helps you sell it faster...and helps keep it sold longer.

USER

When you specify International engines you gain the benefits of skill and experience of engine design and manufacture since 1903. In fact, more four-cycle, heavy-duty International diesel engines have been sold since production began in 1933 than any other make. Reasons for this terrific popularity are such inbuilt features as special delivery pressure lubrication through rifle-drilled passages, replaceable cylinder sleeves, and many others.

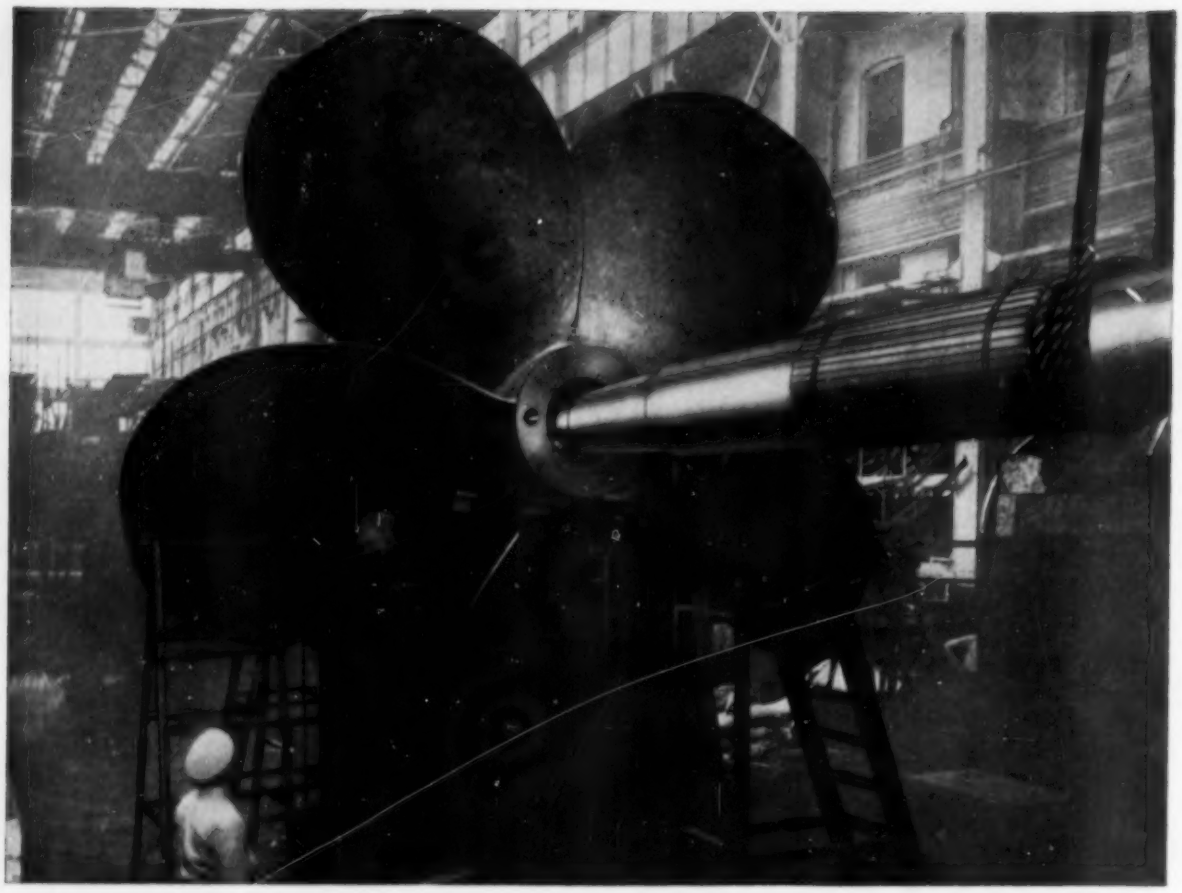
CHOOSE FROM 17 HEAVY-DUTY INTERNATIONAL DIESEL AND CARBURETED ENGINES—FROM 17 TO 214 HP.

See you at the
ROAD SHOW
CHICAGO
Jan. 28-Feb. 2, 1957

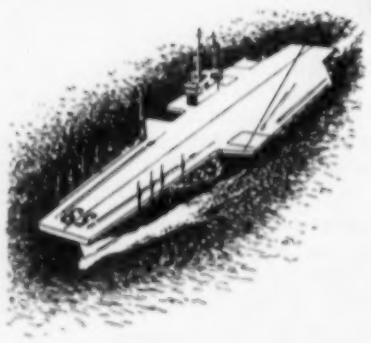
INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Company

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractors and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks.



Aboard the U. S. S. FORRESTAL . . .
Erie Forge Propeller Shafts



NO better example of the capabilities of Erie Forge & Steel Corporation could be offered than the one above. For many years our skilled craftsmen have made steel ingots from raw materials, transformed them into finished products to meet the demands of power transmission in wide variety . . . finished cranks, rotor shafts, drive shafts, connecting rods, a wide diversity of steel castings for industry . . . completed within the confines of one plant with one responsibility and under one control.

Consult with us on your forged steel and steel casting projects —each of us will profit.

ERIE FORGE & STEEL CORPORATION • ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

ERIE FORGE & STEEL CORPORATION

the finest diesels on land or sea use FRAM Filters

Here are the diesel leaders who specify Fram Filters as standard equipment

Allis-Chalmers Manufacturing Co.
Autocar Division of White Motor Company
Bacharach Industrial Instrument Co.
Buda Div. Allis-Chalmers Mfg. Co.
J. I. Case Company
Clark Equipment Co.
Continental Motors Corp.
Cummins Engine Co.
Diamond T Motor Car Co.
Euclid Division of General Motors Corp.
Gray Marine Motor Co.
Harnischfeger Corp.
Hedges Diesel, Inc.
Hercules Motors Corp.
Frank G. Hough Company
Hyster Company
Kohler Company
LeTourneau-Westinghouse Co.
The Lincoln Electric Co.
Massey-Harris-Ferguson, Inc.
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The Ready Power Co.
Reo Motors, Inc.
Schramm, Inc.
R. H. Sheppard Co., Inc.
The Thew Shovel Co.
Towmotor Corporation
Twin Coach Company
Waukesha Motor Co.
Witte Engine Works

Diesel manufacturers and engineers specify FRAM protection for longer engine life . . . less wear . . . fewer repairs.

Give your diesel the same protection the experts choose—get FRAM!

FRAM CORPORATION
Providence 16, R. I.
Fram Canada Ltd.
Stratford, Ontario

FRAM
OIL • AIR • FUEL • WATER
FILTERS

In place of wasteful and uncertain crankcase-oil changing based upon hours in service, many operators now use a better guide that saves them both time and money.

Now you can test used oil in minutes

IT HAS COME as something of a surprise to some maintenance men to discover that they have been throwing away hundreds of gallons of still-good oil . . . year after year. Conversely, it is quite a jolt to realize that a costly engine-repair job could have been prevented by an on-the-spot analysis that would have shown up the condition . . . in minutes!

The recommendations for oil changes issued by engine makers have always been computed on "averages" for the various classes of vehicle service. And like the "average" man on the insurance chart, the average vehicle doesn't exist in the actual fleet. Two engines of the same make and model, operating on the same job, can have quite different patterns of oil economy and engine condition. Obviously no one set of rules can apply ideally to all diesels. And fortunately there is no longer any need for such generalization.

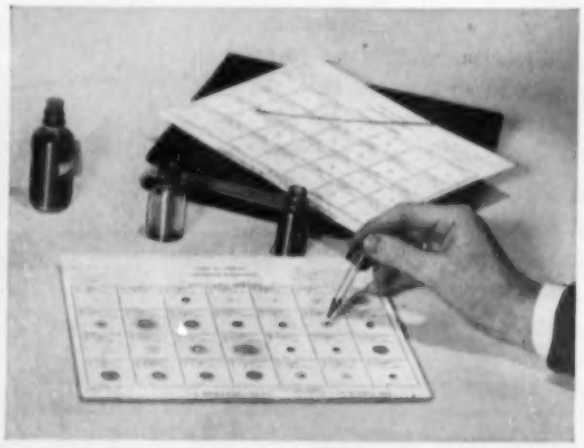
From a couple of drops of used oil, the Shell "ADC* Oilprint Analysis" provides a reliable check of oil condition, in minutes. It is very simple, and with a little practice, it tells you a lot about that oil and the engine that uses it.

What a drop of used oil shows: You place a drop of used oil on a piece of special filter paper supplied by Shell . . . let it stand a minute or two. You will then be able to *see* the following:

Water dilution: Even a tiny amount of water shows up . . . and that means not only that your oil is losing its ability to protect engine parts, but it also shows whether the water represents a normal amount of condensation or something more serious, such as an actual leakage of coolant from a faulty jacket.

Dispersancy/detergency: The same oil drop will give you a picture of how well the special additives in the oil are doing their job . . . whether or not the contaminants are being held in suspension where they do least harm . . . whether the cleansing and dispersing actions are adequate . . . whether the oil is still good.

Adulteration: The color of the oil spot will show whether too much contamination is occurring . . . and



The simple test setup: sample bottles, a wire rod, a bottle of "indicator," and the permanent record card.

This single, on-the-spot sample reveals many things about an engine.

A fleet superintendent sees how easily the test is made.

will very often point up the cause, indicating a check on injectors, nozzles, oil and air filters.

All of the above can be learned from the single drop of oil . . . in an amazingly short time.

Alkalinity: Engine wear and engine deposits increase as the oil becomes acidic in nature due to contamination from combustion products. A special indicating fluid, developed in Shell Laboratories, tells at a glance whether oil is alkaline and still usable, or acid *and how much.*

Operators who keep an ADC Oilprint Analysis record of each vehicle generally find that the crankcase oil stands up longer than they had figured . . . a distinct saving in lubrication cost. At the same time, there is a running check on each engine that often detects impending trouble before its correction becomes costly. In this respect, the Shell ADC Oilprint Analysis qualifies definitely as one of the valuable recent tools of preventive maintenance.

If you are concerned with extending the service of crankcase oil, and with avoiding the risk of using oils loaded with contaminants, we suggest that you have one of the Shell service engineers demonstrate ADC Oilprint Analysis for you.

*Trademark

Photo shows an oil-spot test card...one phase in the visual life record of a charge of oil.

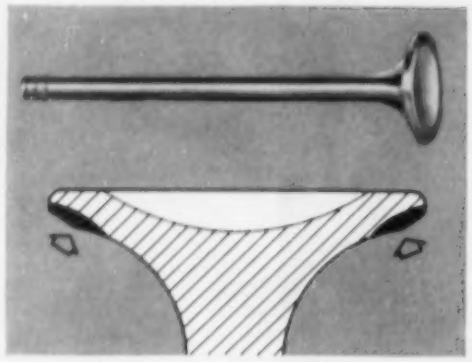
The Shell "indicator" shows acidity instantly. If spot turns red, oil is no longer fit to use, should be changed quickly.

SHELL OIL COMPANY
50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

Electro-Motive Parts Progress

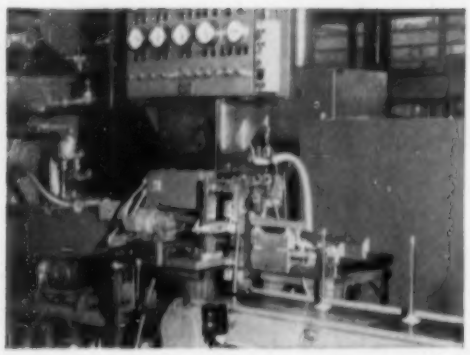
THIS EXHAUST VALVE AVERAGES TWO YEARS SERVICE BEFORE REGRIND



Reasons:

1 *Engine's choice*

Experience has taught us that an engine dictates its own valve needs. Our Model 567 Diesel proved this when previous valve designs of other engines were tried. Exhaustive testing produced the valve shown here, which in normal passenger or freight service runs two years before seat and face regrind. Cutaway view shows special hard Stellite face on valves dictated by our higher horsepower 567C Diesel.



2 *Exclusive manufacture and inspection process*

Manufactured almost entirely by automatic machines, Electro-Motive valves are held to extremely close tolerances. Guarding this precision is a battery of automatic and visual "in-process" inspection controls that assure constant quality and absolute machining accuracy. An example is this electronic machine which checks 14 tolerances at one time on every valve.

3 *Protective packaging*

This special package is used to protect the finely machined surfaces of the valve during handling. Each valve is fitted snugly and protected against moisture with rust preventative V.P.I. paper. Packing like this keeps the valves in perfect condition, always ready for immediate use, and far easier to handle and store.

Continuing improvement is an unending program at Electro-Motive to bring you products of highest quality at lowest cost. When you buy General Motors Diesel parts you get components that are designed, engineered and built to work together. In addition, you benefit with a full warranty and convenient, fast delivery from nine strategically located Electro-Motive warehouses.

GENERAL MOTORS LOCOMOTIVES

ELECTRO-MOTIVE DIVISION · GENERAL MOTORS

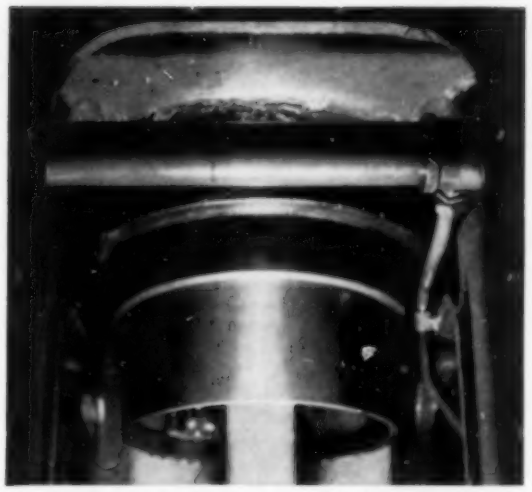
LA GRANGE, ILLINOIS • *HOME OF THE DIESEL LOCOMOTIVE*

In Canada: General Motors Diesel, Ltd., London, Ontario

(l. to r.) Carl Olbertz, Milford plant superintendent, "Rollie" C. Bleimehl, Standard Oil industrial lubrication specialist and Frank Morgan, Milford chief engineer inspect crankcase. Rollie Bleimehl is qualified to give technical service on jobs like this. He's been doing this sort of work for 10 years. Rollie has a mechanical engineering degree from Iowa State College and has completed the Standard Oil Sales Engineering School.

23,000 hours on original rings and bearings—no overhaul

Milford, Iowa, Light Plant gets this performance from engine using STANODIESEL Oil M



"As is" photo of piston skirt and interior of crankcase. No wiping or cleaning was done before photographing or at any time during 23,232 hours engine has been in service. STANODIESEL Oil M is the lubricant.

When a new 720 H.P. Superior engine was put in service at Milford, Iowa in 1949, the plant management knew what oil they were going to use—STANODIESEL Oil M. Their choice was based on previous experience with Standard diesel oils in other engines.

After 23,232 hours of operation, the engine at Milford is still operating with the original bearings and rings. It has not been overhauled. The crankcase, as shown in the photo, is clean. Pistons are clean and bright with no sign of wear. Twice yearly, oil samples have been taken for laboratory analysis. Each time the analysis has shown the oil to be in perfect condition. Good maintenance and STANODIESEL Oil M have contributed to this performance.

Got a hard job for an oil? STANODIESEL Oil M can do it. STANODIESEL Oil M has superior stability. Its additive formula helps to (1) prevent oil viscosity build-up (2) keep crankcase, pistons, cylinder walls and other parts clean (3) control foam (4) maintain film on difficult to lubricate areas and parts.

There's a Standard Oil industrial lubrication specialist near you in any of the 15 Midwest or Rocky Mountain States. Call him for more information about STANODIESEL Oil M. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

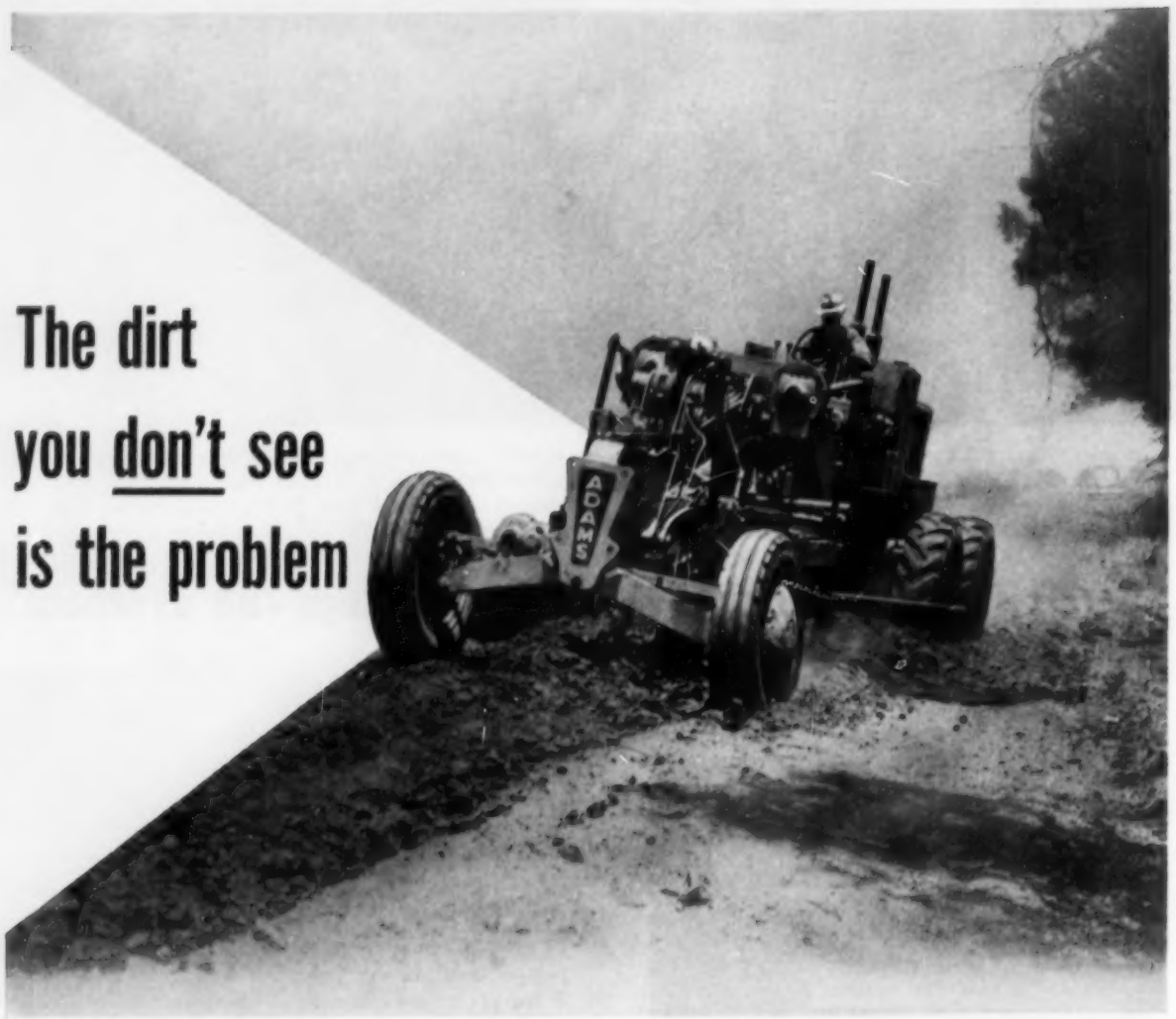
Quick facts about
STANODIESEL Oil M

- Keeps crankcase, pistons, cylinder walls clean.
- Combats deposit and wear problems imposed by use of economy fuels.
- Maintains film on difficult to lubricate areas and parts.
- Eliminates spark plug fouling in spark ignited engines and reduces combustion chamber ash deposits in engines burning natural gas, LPG and liquid fuels.
- Eliminates fuel injector and pump sticking caused by deposits on injector barrel and plunger where fuel and lube oil commingle.

STANDARD OIL COMPANY
(Indiana)

STANDARD

The dirt
you don't see
is the problem



Le-Tourneau-Westinghouse Adams "660" Grader, powered by 150 H. P. Diesel Engine

Dry Type Micronic® Air Filtration solves it

The tons of dirt this grader moves in a day don't give it any trouble at all. But just let a little of the dirt that's drawn in with the air intake get through to the engine and it'll stop dead in its tracks. That's why efficient air filtration is so vital to the operation of this equipment . . . why engine and equipment manufacturers have accepted PurOlator's new Dry Type Micronic® Air Filter as the most efficient yet developed.

Whether your engine is idling or revving at top speed, this new Purolator Air Filter removes 99% of all contaminants. That makes it virtually impossible for harmful abrasives to get into the precision parts of the engine no matter how dirty the job or where you're working. The Dry Type Micronic elements save time and effort in servicing, too. Elements can be replaced in one-tenth the time — and with one-tenth the effort — needed to service other types.

Purolator Catalog AFC-56 contains a valuable chapter "Facts about engine air requirements" that can help you prolong engine life and reduce repair bills. Send for your free copy today. Address Dept. D9-1110.

FILTRATION FOR EVERY KNOWN FLUID

PUROLATOR
PRODUCTS, INC.
RAHWAY, NEW JERSEY

The "DEEPWATER NO. 1" is powered by the newest concept in flexible rig power

The New and Improved
RIGELECTRIC*
by STEWART & STEVENSON

The eyes of the oil industry are on the "Deepwater No. 1", new offshore drilling unit of Deepwater Exploration Company. The eyes of the oil industry are on RIGELECTRIC* also, the newest and most flexible concept in diesel or gas engine electric drilling rig power. It is engineered, unitized and guaranteed by Stewart & Stevenson Services.

On the Deepwater No. 1, power for the drawworks, mud pumps, etc. is furnished by three Stewart & Stevenson Model S241000 RIGELECTRIC Units with a combined horsepower rating of 3000 H.P. Auxiliary power for lighting, blower motors, heating, etc. is furnished by two Stewart & Stevenson Model 6 GD 100 AC, General Motors Diesel powered generator sets.

RIGELECTRIC offers the maximum in dependability and reliability. The skid-mounted unit, which consists of two main generators and four General Motors 6-110 Diesel Engines, can operate in emergencies with one or more engines out of service. Other features include choice of fuel selection, simple controls and low cost maintenance and parts. And despite the flexibility and extra insurance provided by RIGELECTRIC, any mechanical equipment eventually must be repaired and serviced. And oil operators have learned from experience that the full and undivided parts and service responsibility of Stewart & Stevenson stands unconditionally behind every Stewart & Stevenson installation, day or night on land or water.

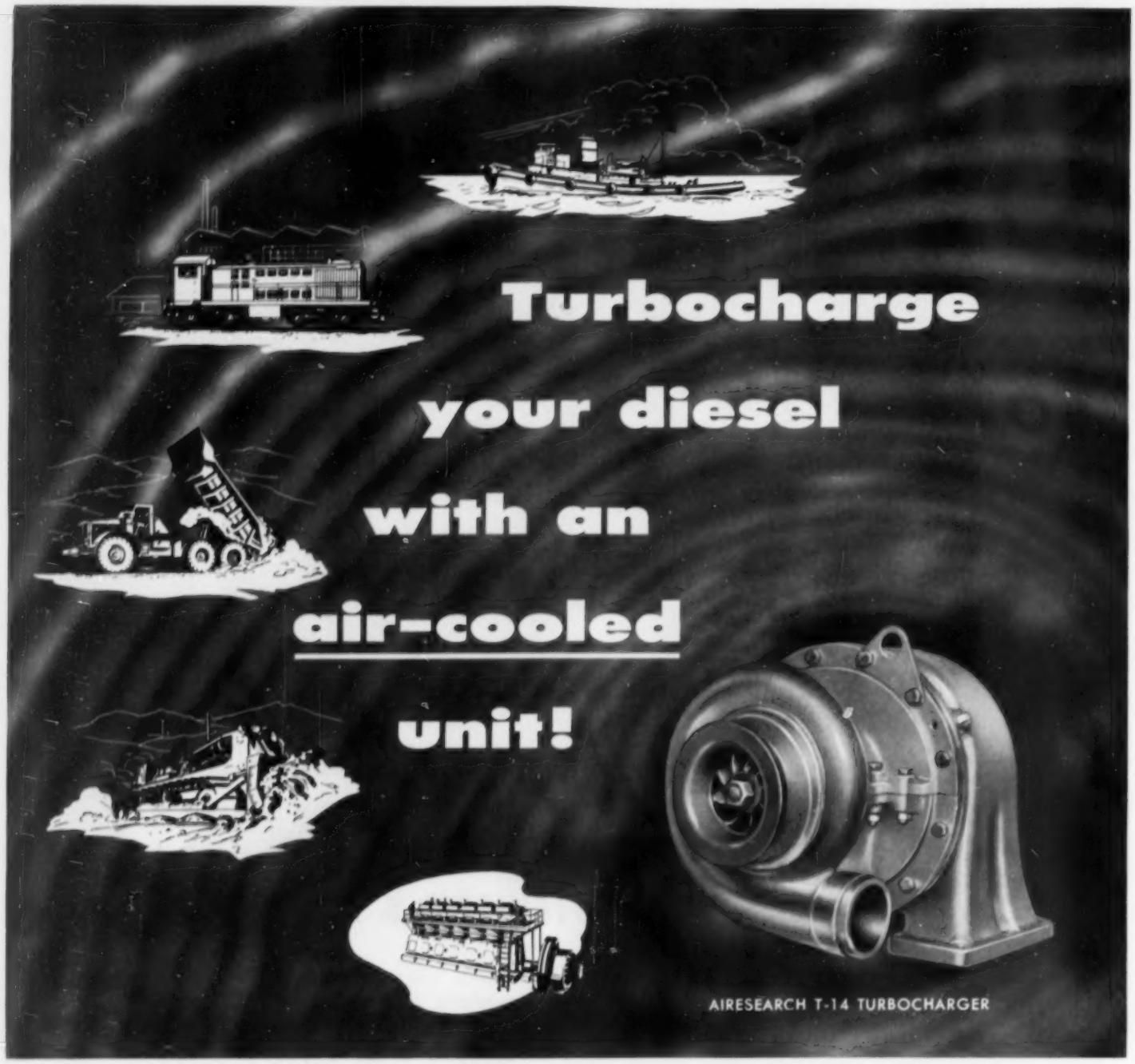
STEWART & STEVENSON SERVICES, INC.

Main Office and Plant: 4516 Harrisburg Blvd., Houston 11, Texas. Phone CApitol 5-5341
Branches: Corpus Christi, Dallas, Lubbock, San Juan, Odessa
Representatives: San Antonio, Longview, Brownsville, Tyler, Pecos

* "RIGELECTRIC" REGISTERED TRADE MARK FOR STEWART & STEVENSON DC DRILLING RIG POWER

THE NATION'S LARGEST DISTRIBUTORS OF GM DIESEL ENGINES

STEWART & STEVENSON



AiRESEARCH turbochargers increase power to the full capacity of the engine, yet require no extra plumbing and put no added burden on the cooling system.

The diesel industry generally has recognized the fuel-saving, noise and smoke reducing and power-adding advantages of turbocharging. But there are important differences between turbochargers. Some are difficult to service and add complicated plumbing because of the necessity for water-cooling.

All AiResearch turbochargers, from the smallest units for mobile equipment to the large, stationary power plant models, are air-cooled. Each contains a removable rotating assembly which simplifies maintenance, especially in the field. Their modern design resulted from the most extensive experience in the field of small turbomachinery in America.

We invite your inquiry on their application to your diesel equipment.

BASIC SPECIFICATIONS FOR AIRESEARCH TURBOCHARGERS

MODEL	T-10	T-14	T-15	T-30-2	T-30-6
Diameter — in. nom.	9	11.5	15.25	15.25	16
Length — in.	9	14.12	16.75	17.25	21.75
Weight — lb.	40	95	125	135	195
Output — lb/min. (Standard Conditions)	25-40	35-65	35-65	70-95	115-175

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

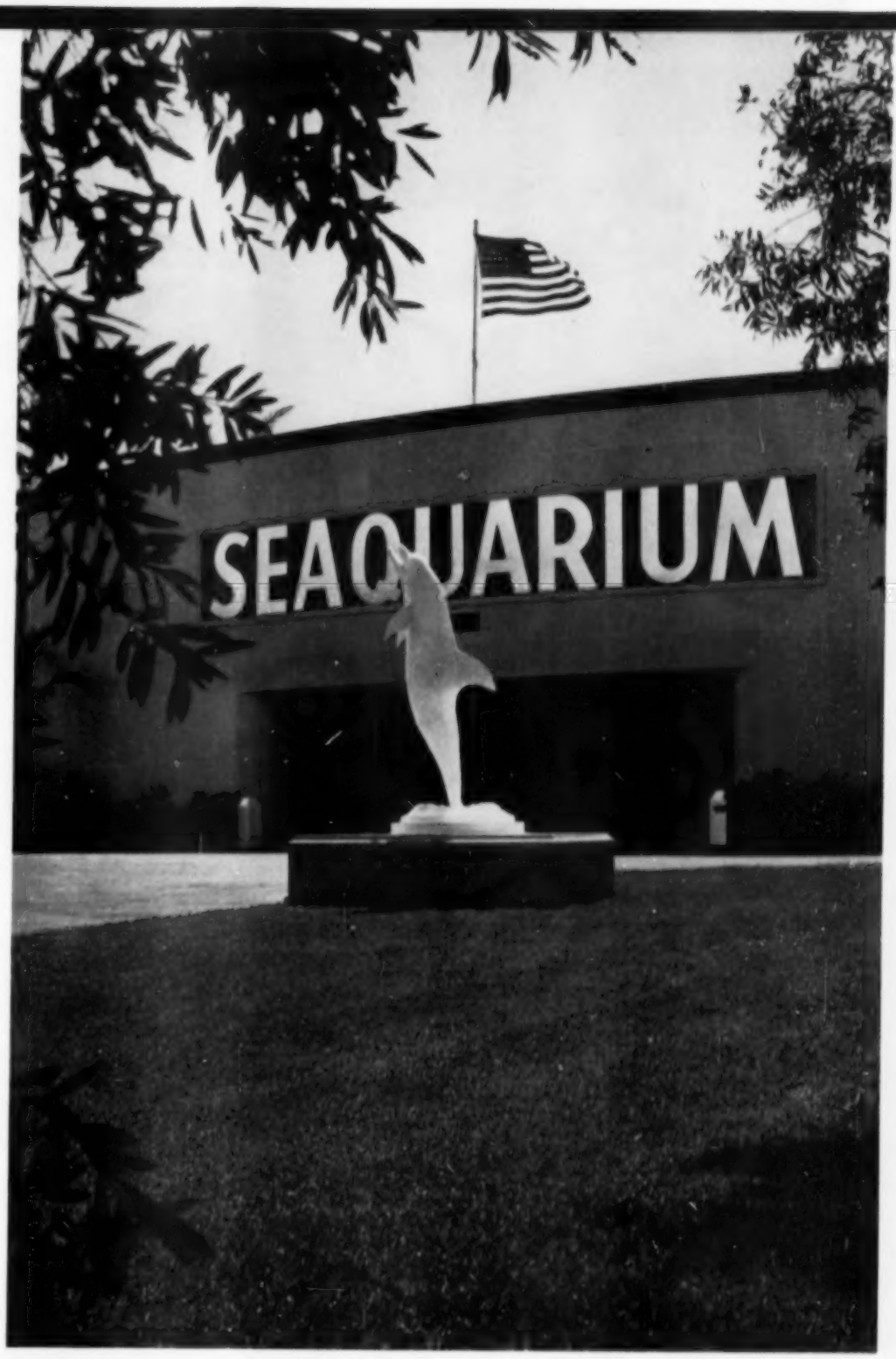
THE "SEAQUARIUM"

By ED DENNIS

MILLIONS of words have been written about fish in the tropical waters and now the public can see them in action. The mammoth marine exhibition is Miami's new sea attraction, the $2,300,000 Seaquarium on Virginia Key near Miami, Florida.

Chief collector for the Seaquarium is Capt. Bill Gray a Scottish man with more then 40 years on the briny deep. Capt. Gray uses his own specially redesigned General Motors dieselized 42 ft ex-navy vessel, which has a winch for raising the large sharks, turtles and porpoises out of their natural habitat. The *Sea Horse* is powered with a General Motors model 4-51 diesel engine which replaced a gasoline engine; mileage increased from ½ mile to 1 mile per gal. and costs dropped from 32 cents for gasoline to 16 cents for fuel oil. This new engine with a 2.5:1 GM hydraulic r&r gears gives the vessel a speed of 9 knots at 2800 rpm. A Maxim silencer model 7MO and a GM power take-off are also part of this installation.

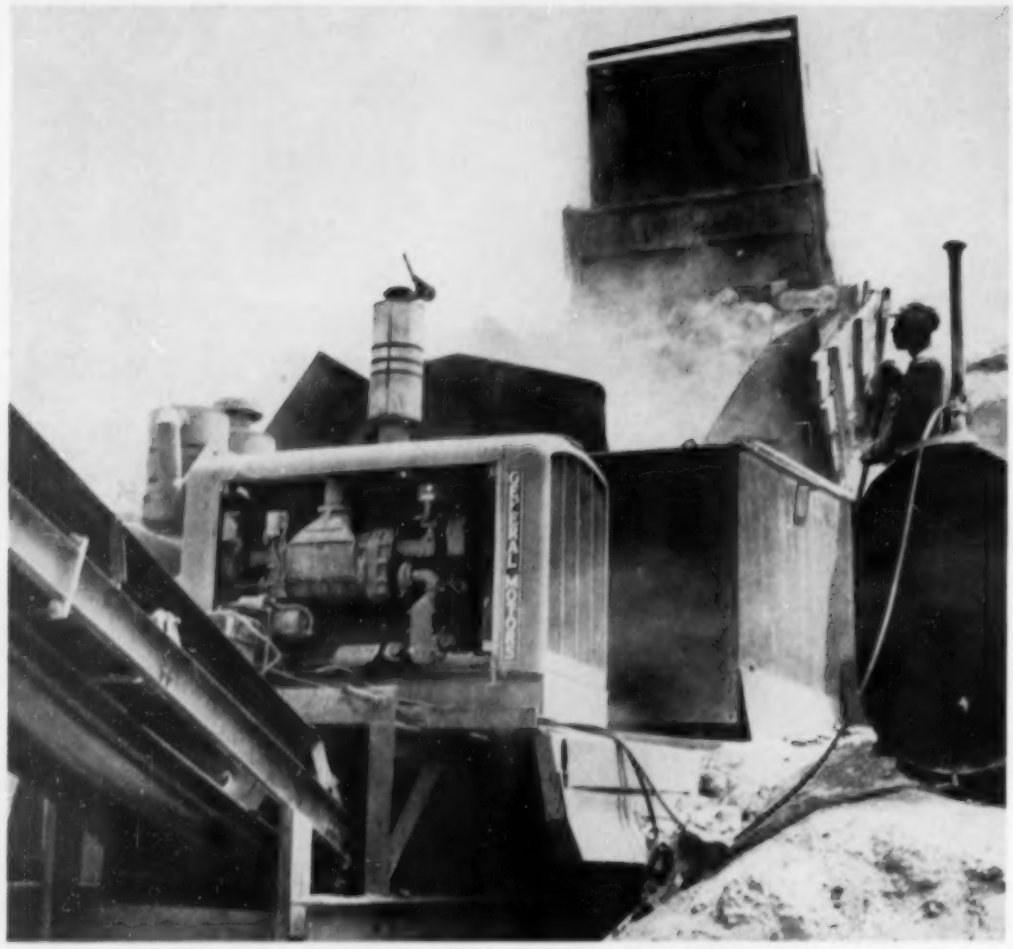
Capt. Gray and his sea going cowboys, Emil Hanson and Ed Woodford have spent the last 12 months gathering every conceivable kind of marine life for the Seaquariums 50 and 80 ft main tanks. With the *Sea Horse*, is a 38 ft barge, the *Sea Cow* and a smaller skiff the *Sea Calf*. This strange fleet of vessels is constantly searching the tropical waters for rare species for the Seaquariums tanks.



The main entrance of the Seaquarium.

The *Sea Horse*, a 40 ft ex-navy craft driven by a GM 4-51 diesel pulling in a 14 ft tiger shark, the largest in captivity.

Aerial view of the Seaquarium on Virginia Key.



Souter Sales went to diesels in 1954 when increased demands for crushed concrete placed too heavy a load on the former power plant. Extra-heavy duty air cleaners arranged in series, recommended by engine supplier, Peninsular Diesel, Inc. of Detroit, effectively trap harmful silicate dusts arising from the concrete crushing operation.

Four years ago, a Detroit building-supply contractor took into account the deluge of old concrete discarded yearly on city dumps and acted on an idea for reworking this scrap material into roadstone for asphalt paving. Souter Sales of Detroit is today crushing up to 500 tons of this scrap concrete per day and is now about to expand the operation to other midwestern cities. The wide acceptance of concrete stone for paving filling stations, parking lots and recreation areas has tripled the company's production since 1952.

A steady supply of scrapped concrete is guaranteed by the convenient location of Souter Sales' crushing plant on Detroit's near eastside. (Next nearest dumping area lies approximately 15 miles from the city's downtown section.) Up to 500 tons of concrete is dumped per day by contractors and city sidewalk maintenance crews.

Scrapped concrete is delivered directly to the company's location on Detroit's eastside by contractors and city sidewalk maintenance crews looking for a convenient location at which to dump. Incoming supply is generally in the form of sidewalk slabs and foundation blocks that have been removed in making way for sidewalk improvement and new building projects. Unscreened and unwashed, the crushed concrete can be marketed at a price that enables paving contractors to cut material costs without reducing the quality of sub-surface materials. The fusing quality of cement plus the more irregular shape of crushed concrete stone provides a no-roll base that compacts better than ordinary roadstone. It is ideally suited for the two-inch thickness of asphalt generally applied in off-the-street paving jobs.

The company uses a 25 x 36-inch Universal jaw crusher equipped with a single 30-foot conveyor for convenient loading of trucks. Power for the unit is provided by a 6-71 Detroit diesel engine. Despite the highly abrasive silicate dusts encountered in crushing concrete, preventive maintenance procedures recommended by Peninsular Diesel, Inc., Detroit diesel engine distributors, and extra-heavy duty air cleaners have kept engine maintenance costs at a minimum, according to the company. Present facilities were set up in 1954 and are manned up to 15 hours per day.

New Bulletin

New 6-page, three-color bulletin–TTS-121– illustrates special features of new TerraTrac hydraulic backhoe, with detailed operational drawings, and complete specifications for both backhoe and TerraTrac crawler tractors on which it can be mounted. New backhoe, first of its kind to be designed, built and fully warranted by a crawler tractor manufacturer, for heavy-duty crawler use, is said to offer 12 exclusive features, including: increased reach and digging depth, stress-engineered box-section boom and dipper stick, and foot pedal swing-control. Increased power and speed for tough digging, together with improved balance, stability and low price, are additional advantages claimed by the manufacturer. For free copies of new bulletin, write American Tractor Corp., Churubusco (Ft. Wayne), Ind. ITS NEW

Osseck To Springfield

The appointment of Arthur F. Osseck as an assistant purchasing agent was announced today by White Diesel Engine Division of the White Motor Company. The 47-year-old Osseck ended a 15-year association in St. Louis with the Nordberg Manufacturing Company to join White Diesel. He was an assistant purchasing agent at Nordberg's Busch-Sulzer Division for eight years and previously held production positions with the company.

Wells Cargo Adds Ten

Delivery of 10 Kenworth model 825 trucks to Wells Cargo, Inc., of Reno, Nevada, is announced by R. D. O'Brien, vice president in charge of sales for Kenworth Motor Truck Company of Seattle. The newest Kenworth additions to the Wells Cargo fleet are powered with Cummins NTO 262 horsepower turbocharged diesel engines. The custom-design of the trucks includes use of aluminum for frames, cabs, running boards, battery boxes and fuel tanks. Kenworth's torsion spring tandem axle drive was specified by Wells Cargo. The trucks have tubeless tires.

Moeller Moves up

Carl H. Moeller

Carl H. Moeller, formerly service engineer at Des Moines, Iowa, has joined the contract engineering group at San Francisco headquarters of Enterprise Engine & Machinery Co. Moeller's new assignment follows nearly two years of service engineering work in San Francisco and in the field for Enterprise. His industry experience totals nearly 10 years, including diesel work in installations at Turkey, Aden, French Morocco, Tangier, Eniwetok, and Alaska. Moeller is a veteran of engineering department service in the Merchant Marine during World War II, and he has since served 4 years in the Naval Reserve.

Any time you come to the conclusion that valves are just as good when ground in the old fashioned way by hand, try it and see for yourself how long it takes to burn 'em up.

WAUCHULA, FLORIDA

Installation of High Output Diesel Insures Continuing Power Plant Savings.

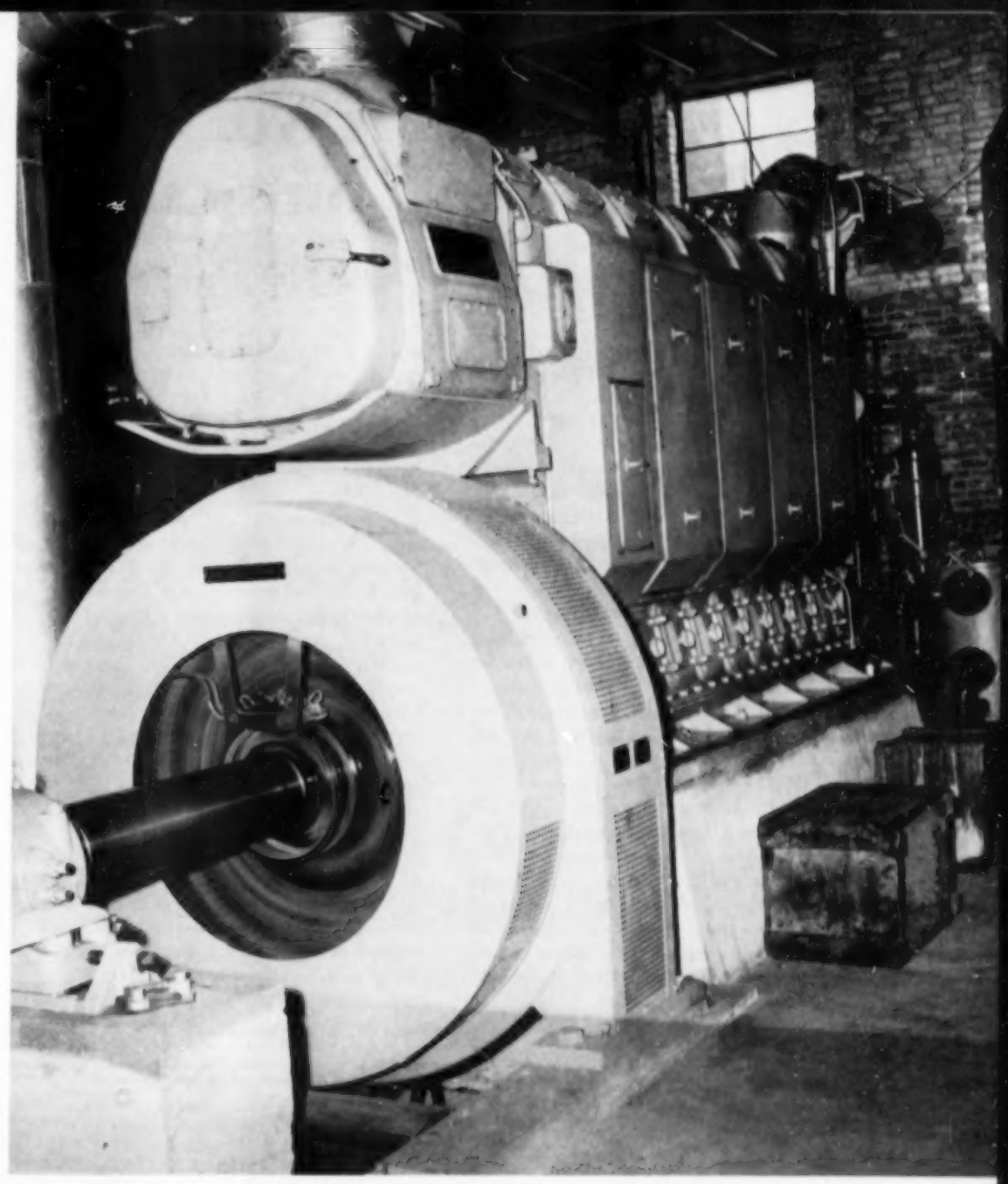
THE new diesel generating unit installed recently in this 35 year old municipal power plant at Wauchula, Florida, is a 1280 hp Fairbanks-Morse opposed piston diesel engine driving a 1125 kva Fairbanks-Morse generator.

The City of Wauchula has a population of about 3500 persons and is situated in the west central part of the State of Florida. Largely a winter vegetable center, it lists among its industries a few small factories, plus several citrus juice canning houses and is also known as the cucumber center of Florida. The peak load at the municipal power plant during the winter season when the canning industries are running full capacity, is about 1500 kw. This drops off to about 9 or 10 hundred kw during the summer season.

The power plant's history dates back to 1922 when it acquired two 135 kw Fairbanks-Morse diesel generating units. In the years preceding that the City bought electrical power from a small orange crate mill located in the city. The city continued to grow in size and more and more people brought electricity into their homes. In 1925 two more Fairbanks-Morse generating units were acquired and again in 1951 another Fairbanks-Morse diesel was installed.

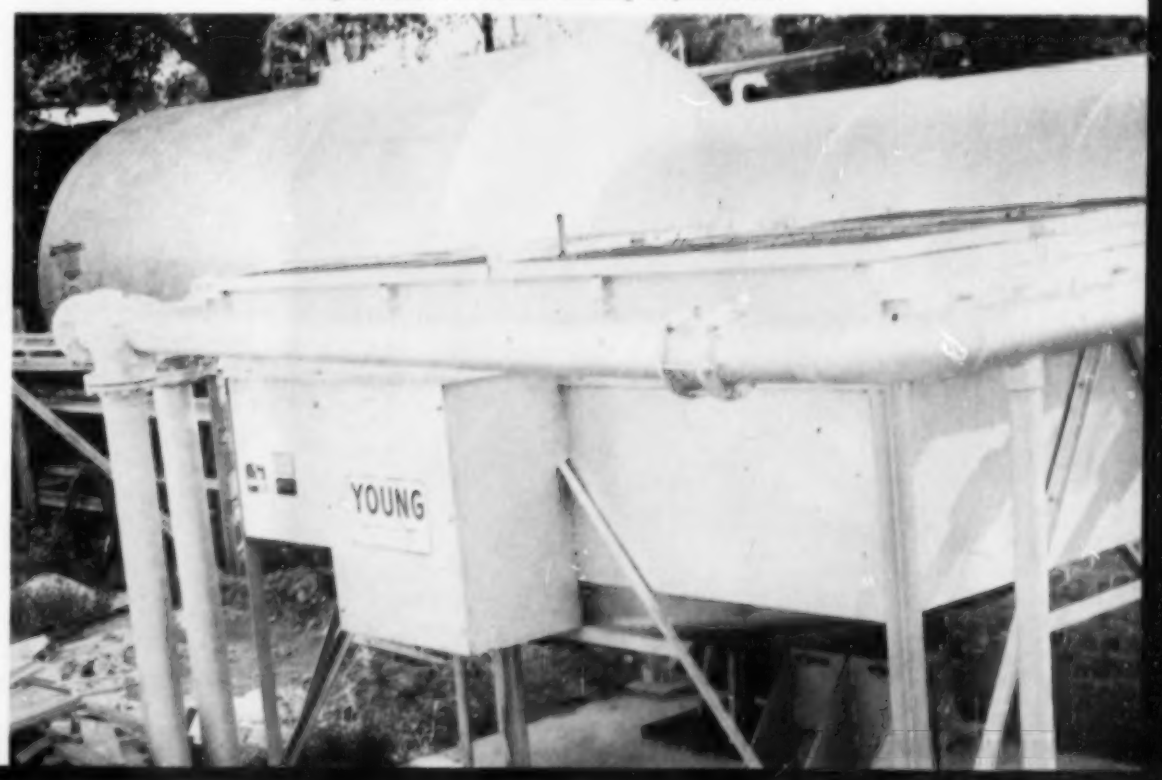
In the later part of 1954 the city fathers decided to install another diesel generating unit to replace an older model and bring the plant up to date with an increase in efficiency and greater flexibility during the different seasons. In line with this reasoning, it was decided to purchase an opposed piston type Fairbanks-Morse diesel, which reflected the trend toward a higher output from a given size engine. The new engine rated 1280 hp at 720 rpm with an 1125 kva Fairbanks-Morse generator and a Woodward U.G. 8 governor. Gulf #2 fuel oil and Gulf Parvis lubricating oil are used. The fuel oil is hauled from Tampa in hiway tankers and pumped into storage tanks in the rear of the plant.

Immediate responsibility for the Wauchula plant lies with Leavy Deal, chief engineer, who started with the plant in 1926 and has helped it grow. The considerable savings which have resulted in the new installation are being used for further improvements in the utility system.



The 6 cylinder O.P. Fairbanks-Morse diesel rated 1280 hp and developing 1125 kva at 720 rpm.

The Young horizontal core radiator handling the jacket water.



DEEPWATER NO. 1 FOR OFFSHORE DRILLING

By DOUGLAS SHEARING

THE growing impact of offshore oil drilling on the South's economy was emphasized when the first vessel of its kind ever converted in an East Coast shipyard was christened at the Gibbs Corporation here. Mrs. J. H. Hester, wife of the executive vice president and general manager of the Deepwater Exploration Company of Houston, Texas, christened the offshore drilling tender *Deepwater No. 1* before 3,200 shipyard workers and their wives, civic leaders, executives of the oil and drilling industries and shipyard officials.

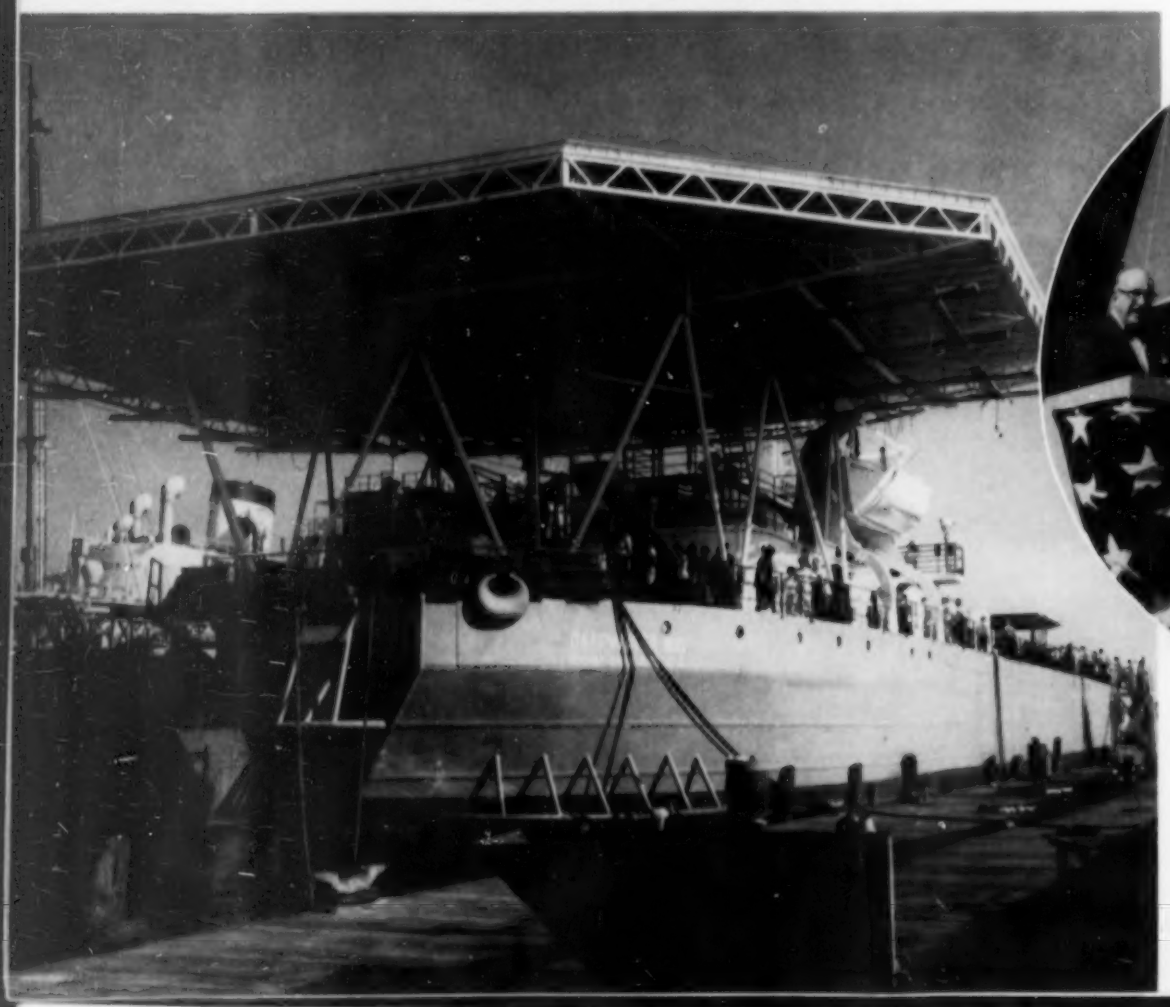
The *Deepwater No. 1* is not just another drilling tender. Actually, the story of the craft is another saga of American shipbuilding. Not just a saga of technical or production accomplishment alone, but one embracing determination, courage, imagination, work and teamwork—all the ingredients of the American success story. Earlier this year when the Deepwater Exploration Company was formed in association with Anderson Prichard Oil Company, Climax-Molybdenum Corporation, Bert Bock, president, and Hugh Hester, executive vice president, it was determined that a new fixed drilling platform and a tender to serve it must be built by a certain deadline date. Moving rapidly and surely, Messers Bock and Hester retained the services of Friede & Goldman, Inc., naval architects and marine engineers, to do the design work and specifications for the conversion of the M. V. *Excello* to an offshore drilling tender. The company also secured Arthur J. Darden, naval architect, as supervising architect on the job.

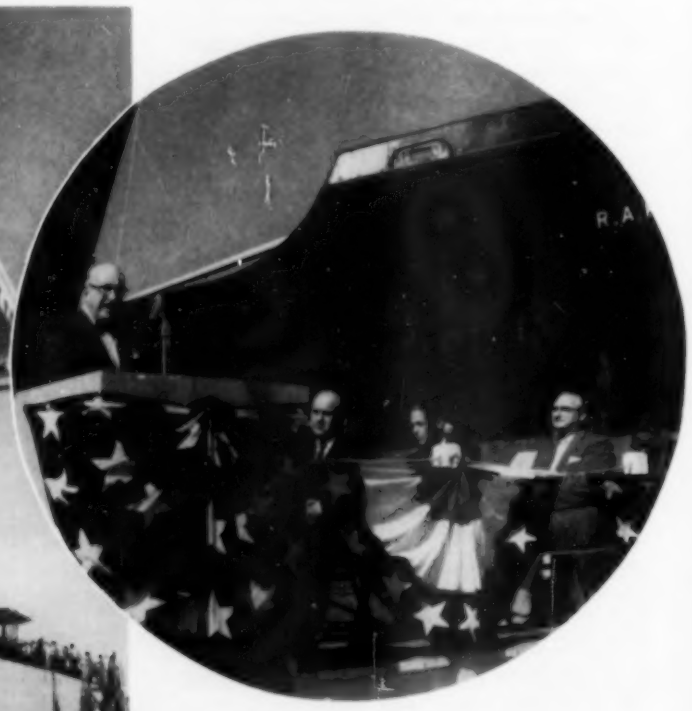
Almost concurrently, they ordered the drilling machinery to drill to 20,000 feet or more from the National Supply Company, the fixed platform from J. Ray McDermott of New Orleans, the diesel electric generators, motors and controls from Stewart & Stevenson, Inc. of Houston, the 25-ton Whirley crane from Link Belt Company, and started to check the shipyards. The naval architects, working against time and realizing its importance, completed the contract drawings and specification in ten working days. Deepwater then executed a contract with the Gibbs Corporation of Jacksonville for the conversion-alteration-rebuilding job in the almost unheard time of 75 calendar days. Such a record was only possible by almost perfect planning, coordination and cooperation between owner, naval architects, equipment suppliers and the shipyard, coupled with a common will to win and the leadership and inspiration of Bock and Hester.

Christening of the *Deepwater No. 1* came under sparkling skies in the Gibbs shipyard. The traditional bottle of champagne was broken over the bow of the flag-bedecked vessel by Mrs. Hester, and George W. Gibbs, Sr., chairman of the board of the Gibbs Corporation, emphasized: "The *Deepwater No. 1* will take to sea the facilities of the land—a supply house, a power house, a seaport and an airport." In a brief talk, Bock noted that an engineer recently returned from Russia reported that Soviet oil exploration companies can drill in only 15 feet of water in comparison to the 100 ft depth capabilities of the *Deepwater No. 1*.

George W. Gibbs, Sr., Chairman of the Board of Gibbs Corporation delivered the main address at the christening of the *Deepwater No. 1*, the offshore drilling tender converted by Gibbs for Deepwater Exploration Company of Houston, Texas. Also on the platform in view of the camera are B. V. Bock, President of the Deepwater Exploration Company, Raydon Burns, Mayor of the City of Jacksonville, Florida, Hugo Hester, Executive Vice President of Deepwater Exploration Company and David W. Jackson, Executive Vice President of Gibbs Corporation.

Guests attending the christening of the *Deepwater No. 1*, offshore drilling tender converted by Gibbs Corporation for the Deepwater Exploration Company of Houston, Texas, take a personal tour of the ship following the ceremonies.





Also attending were W. F. Aberly, Morris Wilmot, Rear Admr. W. D. Brown, USN (Ret.), and other officials of the Gibbs Corporation; W. H. Harpst of the Shell Oil Company, J. O. Sanders and Julian Dupree of the California Company; G. D. Almen of the Sinclair Oil & Refining Company, J. C. Craig of the Continental Oil Company, H. C. Peterson, president of the Freeport Sulphur Company oil and gas division, Ed. Paramour, manager of the Halliburton Oil Well Cementing Company. Others present included Bert Birnie, vice president of the Security Engineering Company; E. E. Childress and N. J. Herman of Stewart & Stevenson, Inc.; Herman Vaughn, John Babb, John Emery, James Monroe and P. D. Waters of the National Supply Company; T. B. Waggoner of Petroleum Marine Services; Kenneth R. Joynt of the Magnolia Petroleum Company; Charles Graves of the J. Ray McDermott Company; Dick Loeffler of the Deepwater Exploration Company; Gay V. Land of the Climax Molybdenum Company; Carl J. Lamb of Friede & Goldman, Inc.

The *Deepwater No. 1* has an overall length of 327 feet, nine inches; beam moulded, 50 feet; depth at midship moulded, 25 feet; draft loaded amidship, 12 feet, six inches, and has accommodations for 44 men. All living quarters and offices are air-conditioned. All refrigeration, cooking, recreation, living, laundry equipment, furniture and quarters are the most modern, efficient and sanitary that can be provided. The craft will serve the company's oil drilling platform which is about 12 miles off the East Cameron area of Louisiana and is now on location. A unique feature of the *Deepwater No. 1* is the helicopter landing deck, permitting the shuttling of crewmen, supplies and equipment to and from shore.

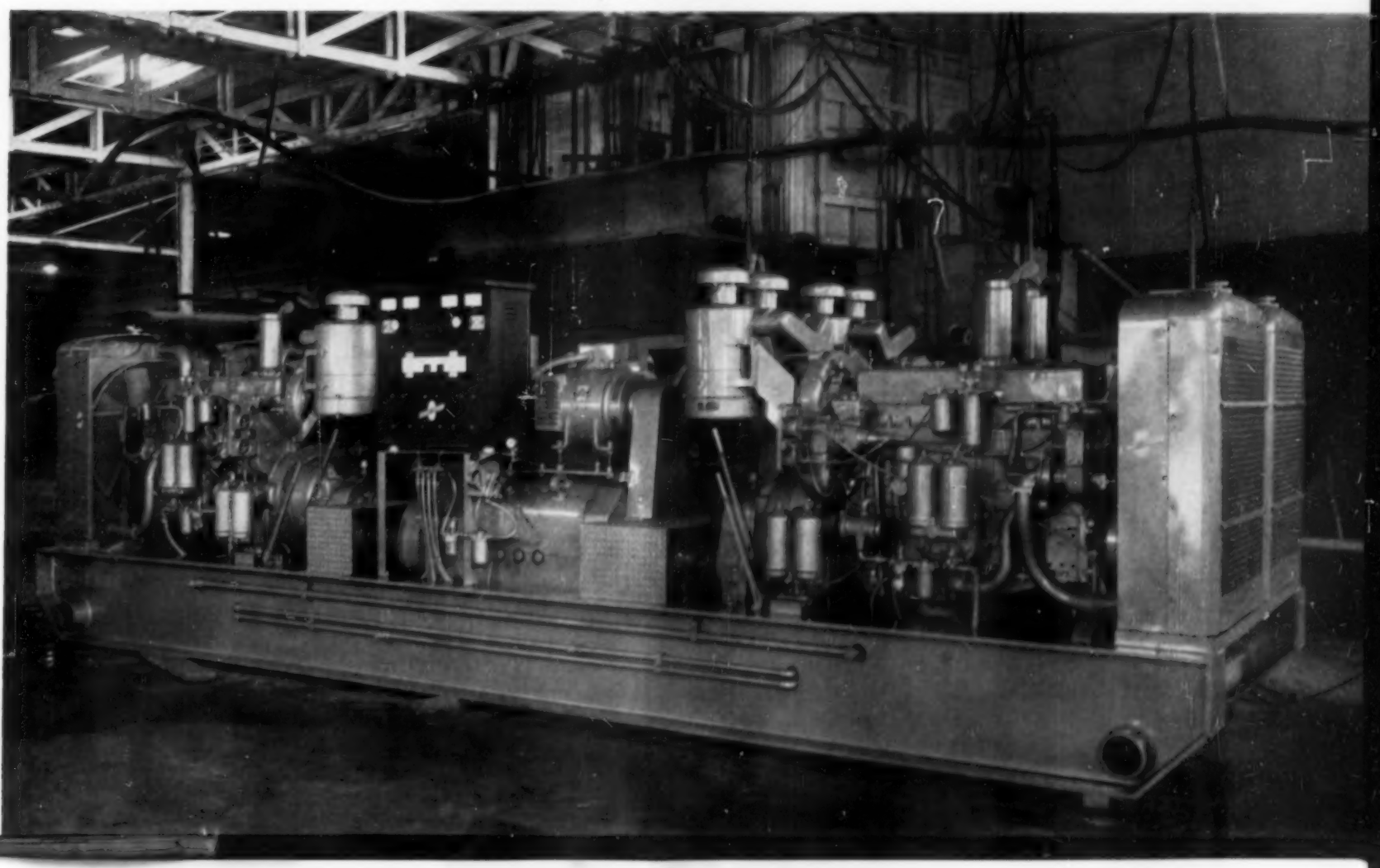
Power for the drawworks, mud pumps, etc., is furnished by three Stewart & Stevenson model S241000 RIGELECTRICS with a combined horsepower rating of 3000 hp. The National Model 130 drawworks is driven by dual shunt wound, direct current traction type motors with a combined intermittent horsepower rating of 1700. Two National mud pumps are each powered by dual shunt wound direct current traction type motors rated at 1200 continuous horsepower combined. Another National mud pump is powered with a 600 continuous horsepower dc shunt wound motor. Auxiliary power for lighting, blower motors, heating, etc., is furnished by two Stewart & Stevenson model 6GD100 ac General Motors diesel generating sets.

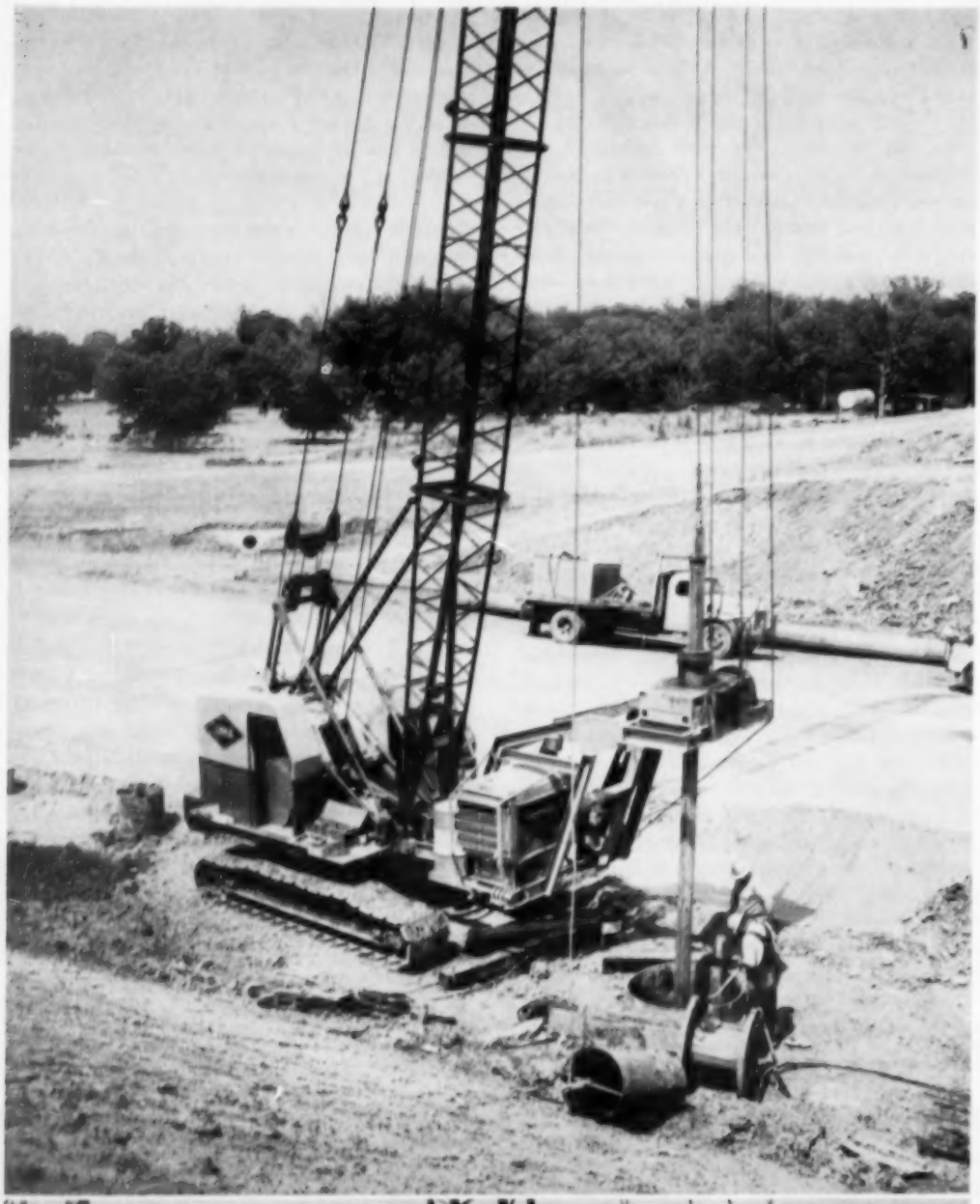
Stewart & Stevenson introduced RIGELECTRIC power earlier this year to the oil industry. Briefly, the RIGELECTRIC model S241000 Unit consists basically of four model 6-110 General Motors Detroit diesel engines, rated 250 hp each. The engines are unitized and arranged on a common steel skid type base. The engines are arranged in a manner so that one power unit is directly connected to each end of a heavy duty traction type dc generator with a capacity of 600 hp continuous. The engines are connected to the generator shaft extensions through a heavy duty disconnect clutch and flexible connection on each engine. Special attention has been given to the arrangement of the flexible connection to permit satisfactory operation under extreme oilfield conditions. All four engines and the two generators are compounded in such a manner as to permit the power of from one to four engines to be input to either one or both of the two generators.

Particular attention has been given to simplification of the entire control system on the RIGELECTRIC equipment. To insure the very maximum in simplicity and reliability, each motor is operated from an individual generator so that there is never more than one motor being driven from a single generator. This arrangement permits the use of a simple rheostat, low voltage control to a pilot exciter for each generator which controls the speed of the electric motor without the necessity of a multitude of complicated controls.

The unique control system combined with the use of a separate generator for each electric motor, is so simple that usual drilling rig personnel without specific electrical training can easily understand it and trouble shooting can be accomplished without the need of highly trained electrical personnel. Some of the more important advantages of the RIGELECTRIC arrangements are as follows: (1). Interchangeability of components; (2). Multiple engine dependability; (3). Simple controls; (4). Longer engine life with less Maintenance cost; (5). Reduced fuel consumption; (6). Parts and service availability.

A new concept in diesel electric rig power is installed on the *Deepwater No. 1*, the Stewart & Stevenson RIGELECTRIC. Basic construction is four General Motors Detroit diesel model 6-110 engines connected to two 600 hp traction generators with a capacity of 600 hp continuous each.





DIESELIZED PIER HOLE BORING UNIT

By MICHAEL T. PATE

HARRY NEWTON, general contractor of Graham, Texas, was successful bidder on the boring of pier holes for a section of through highway overpasses. One of the specifications called for 54 in. diameter holes down to 130 ft in depth—requirements far beyond the capacity of the usual stepped-up post- or phone pole-digger.

Newton designed a boring machine which utilized a standard rotary table such as is provided on many of the smaller portable drilling rigs used in oilwell prospecting—the table is an Ideco, 14½ in. rotary, with a 12 in. table as alternate. With Frank Perrin assisting on the design, a sturdy elevated platform was fabricated, set at such a height that ample clearance was afforded with the bit fully retracted. Drive from engine was through a two-step chain, allowing desired table speed with regard to desired engine shaft speed without use of large sprockets and consequent impaired clearance.

Individual power unit on this foundation hole boring rig provides close control of bit action with elevated rotary table affording required clearance for retracted bit.

Compact mounting of Waukesha diesel on main frame extension of crawler crane allows short chain drives between power and rotary table. Wire line from crane supports outer end of platform with crane hoist controlling bit depth.

The diesel driving this rig is a Waukesha, model 140 DZBU, operating at 1800 rpm, at a horsepower output of 133. The engine is carried on an extension of the main bed frame of the Lima crane, with a trapezoidal frame extending upward and outward to carry the second horizontal portion, on which the Ideco rotary table is mounted. Final drive to the boring unit is equipped with a Twin Disc torque converter and reverse.

The rotary table permits drilling of foundation pier holes to be vertical, or with any specified slope up to 1 in 12. Feed of the bit as the bore progresses is with the main hoist of crane, the diesel on boring unit being used entirely for rotating the bit.

SANDRA MARIE BOASTS OF SELF SUSTAINED TURBOCHARGED TWO CYCLE DIESEL

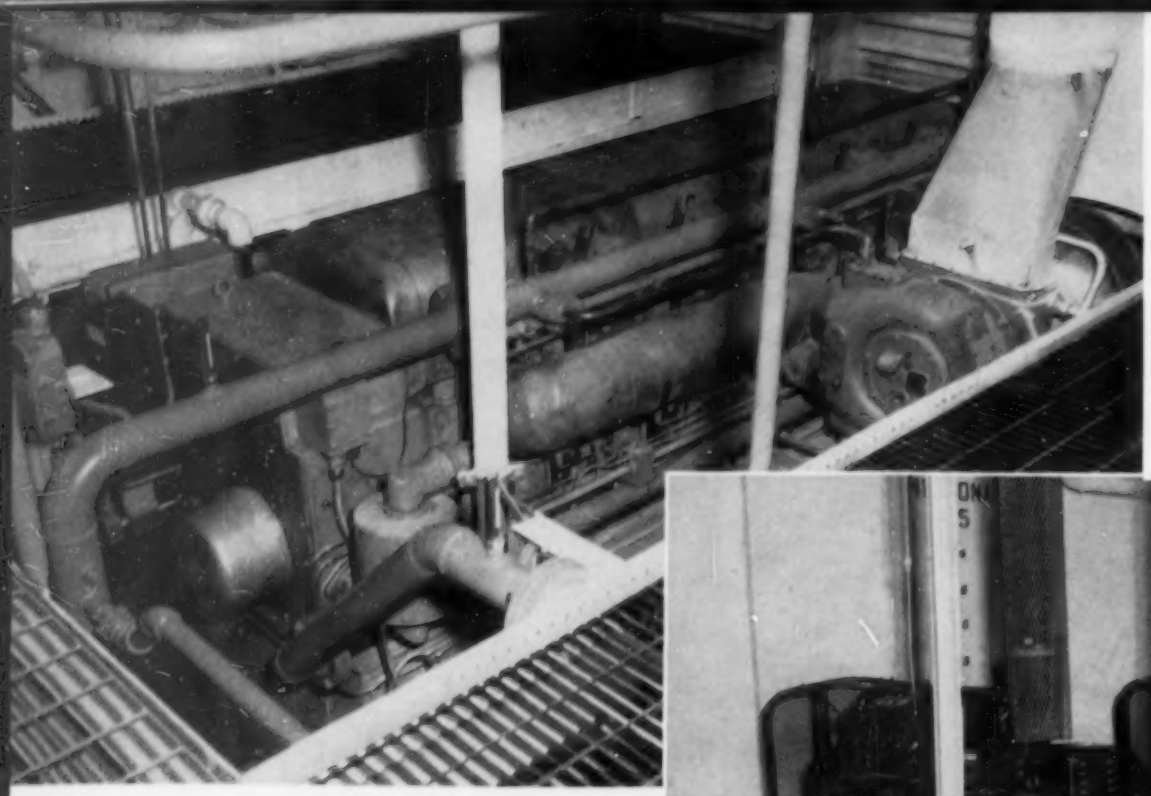
By ARNOLD B. NEWELL

JOLIET, Ill., September 22—At this busy river port it was my pleasure to board and inspect one of the most interesting towboats of contemporary design and powering. I was accompanied by our managing editor, Bruce Wadman. The vessel is the *Sandra Marie,* which recently joined the Inland Waterways fleet and now has to her credit some 500 hours of satisfactory operation according to her owners, the S&S Marine Towing Company of this city. The company is headed by Mr. H. V. Schreiner and N. G. Shelot who also own and operate the towboat *Franklin D. Roosevelt.* The naval architect who deserves considerable credit for design of new vessel is R. A. Stearn and builders are Christy Corporation of Sturgeon Bay, Wis.

Towing operation in this region is through waterways such as the Sanitary Ship Canal, the Calumet Sag Channel, the Des Plaine and the Illinois Rivers and it connects with the Mississippi. It is therefore necessary that boats be lower than conventional river towboats in order to pass under the bridges. Consequently the *Sandra Marie* has a single deckhouse and retractable pilothouse operated by an electric-hydraulic lift designed by Mr. Stearn and built by the Rotary Lift Company.

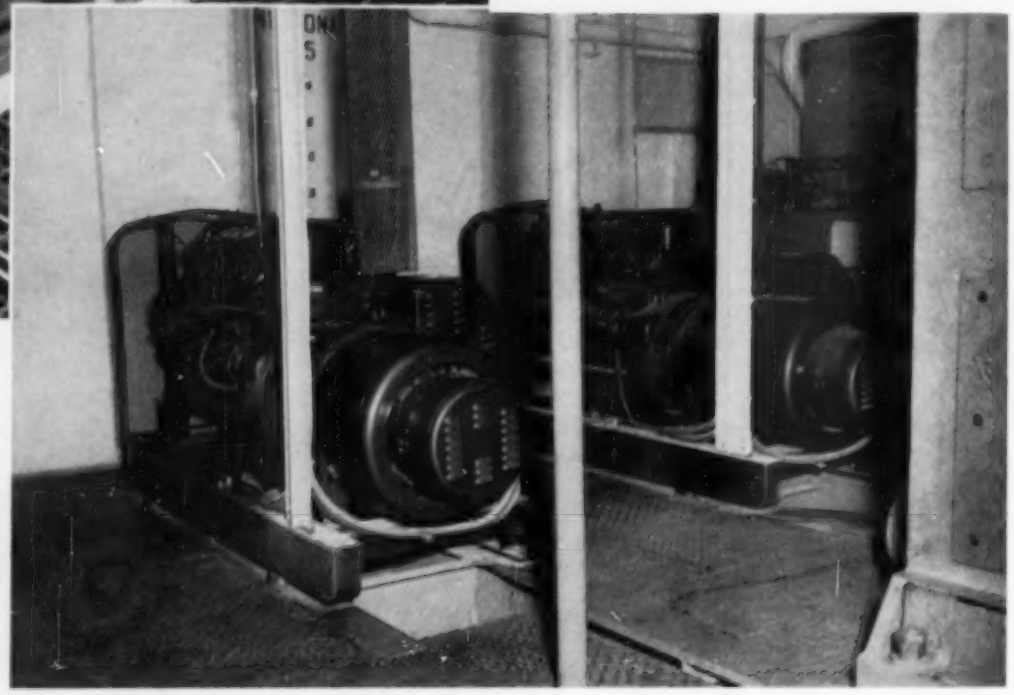
The christening ceremony took place at the home port, Joliet. From left to right we see Mrs. N. Shelot, Norbert G. Shelot, Mrs. H. V. Schreiner and Sandra Marie Shelot, who did a professional job of breaking the bottle. Then Herbert V. Shreiner, R. Stearn, N. A., Mrs. R. Stearn, Mrs. B. Lienau and Mr. Lienau of Christy Corp.

The *Sandra Marie* has clean lines and retractable pilothouse for operation on waterways with low bridges in the Chicago area.



Upper engineroom view of the Kahlenberg main engine showing the Napier turbocharger installation clearly. Alnor pyrometer is on engine at left.

The two 35 kw auxiliary generator sets consisting of Waukesha diesels and Electric Machinery alternators are installed forward in the engineroom.



Boats of this type are somewhat more trim in appearance with pilothouse lowered, but they are infinitely more functional with it up. The diesel exhaust, which in this instance is silenced by Maxim, is never offensive and therefore the boat has fixed stubby stacks with a streamline effect bearing the company's S & S insignia.

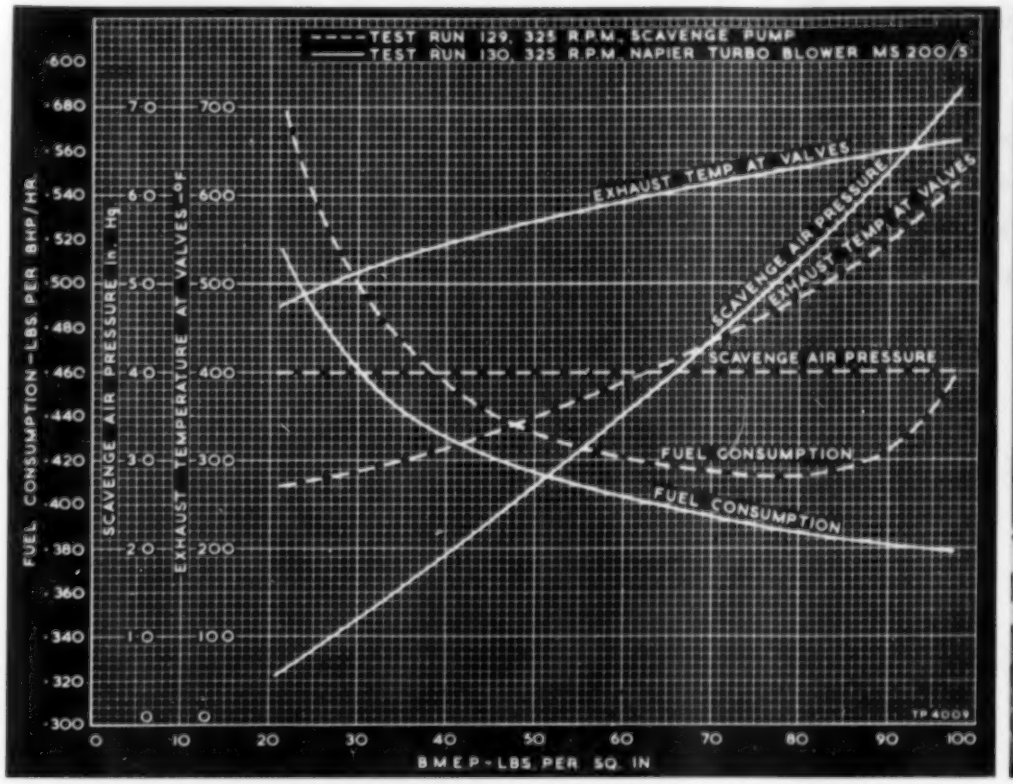
There are several features of particular interest to operators on the inland waterways in the design of this boat. One is that the builders have standardized on the basic design elements of the *Sandra Marie* which incidentally bears the name of the pretty young daughter of Bud Shelot. Another matter of prime interest is completion of this all welded steel vessel from keel laying to delivery in 3½ months. Being set up for standardization may account in large measure for the speed and efficiency of construction and powering and the excellence of the end result. Power arrangement in the standard boats can be single or twin screw from 750 to 2000 hp in a hull having a length of 85 ft, beam of 26 ft and depth of 9½ ft.

The propulsion machinery in the *Sandra Marie* is of particular interest because it is one of the new Kahlenberg Model E 6 2-cycle uniflow turbocharged diesels which are directly reversible and operate equally well in either direction of rotation with no supplementary supply of scavenging air. Although DIESEL PROGRESS has previously described these engines in complete detail, a few of the more salient features are worth repeating. Rated 700 hp at 350 rpm, the engine is a 6-cylinder unit with a bmep of 95 psi. Light weight is achieved through the use of a one-piece welded steel frame, aluminum doors and elimination of the conventional pump or blower for scavenging. It is equipped with removable cast iron liners and oil cooled pistons. Liners are carried in individual, removable cast iron jackets. A closed cooling system is used with over-size Bell and Gosset heat exchangers.

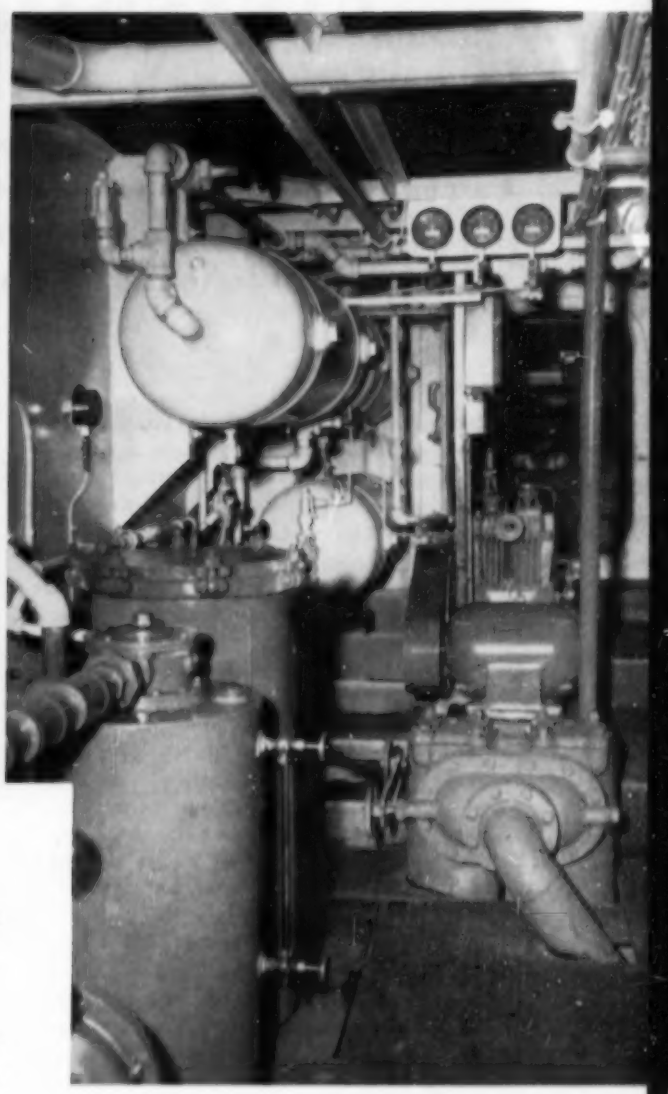
Pistons and connecting rod assembly can be removed through the crankcase doors without disturbing the rest of the engine assembly. The one-piece camshaft can be taken out without disturbing the multiple chain drive. The camshaft operates two exhaust valves for each cylinder, the individual fuel pumps and the air starting valves. It is moved longitudinally and reversing is accomplished by controls on the engine and in the pilothouse. Scavenging air passes through a large intercooler before entering the air box. Although essential accessories are all attached and driven by the engine, making it an independent power unit, it has the low rate of fuel consumption of 0.38 lb per bhp/hr. It is offered in 4, 5, 6, 7 and 8-cylinder models and the rated power output of the 8-cylinder engine is 1065 hp at a total weight of 38,000 pounds.

The 6-cylinder model is 11 ft 7 in. long and all models are 6 ft 6½ in. high in overall dimensions. Generally speaking the working components such as forged steel crankshaft and forged connecting rods with semi-floating piston pin clamped in the eye are of conventional design. Pressure lubrication is used and the oil is cooled by a shell-and-tube type oil cooler. The thrust bearing is mounted inside the engine base between flywheel and coupling. Pressure gauges and Weston electric tachometer are mounted on an attractive instrument panel with an adjacent Alnor pyrometer to check exhaust gas temperatures. All essential safety equipment for engine protection is included in the installation. A matter of special significance is the fact that this engine operates at a speed conforming to the generally required propeller speed for boats of this kind, and no reverse or reduction gearing is required. A set of Michiana Commercial filters keep the lube oil clean and the fuel passes through a purolator fuel oil filter.

Initial tests and service performance of the turbocharged Model E 6 Kahlenberg have been highly satisfactory. It starts easily and maneuvers quickly and the owners have expressed a great deal of satisfaction with the performance. Without the aid of blower or other parasitic air supply the combustion characteristics are good throughout the speed and load range. Advantageous effects of turbocharging are shown on the specific fuel consumption curves reproduced herewith. No small credit for the performance is due D. Napier & Son, Ltd. London, who supplied the turbocharger for this engine, for their part in a joint detailed investigation with Kahlenberg of the application of turbocharging to the engine. On the graph we note an appreciable reduction over the whole bmep range, and from 80 bmep, where the fuel consumption curves of the mechanically scavenged engine begin to climb the improvement is even more pronounced. At 100 bmep the fuel consumption curve is still flat suggesting even greater economies at higher bmep.


TEST RUN 129, 325 R.P.M. SCAVENGE PUMP
TEST RUN 130, 325 R.P.M. NAPIER TURBO BLOWER MS.200/5
FUEL CONSUMPTION - LBS. PER BHP/HR.
SCAVENGE AIR PRESSURE In. Hg.
EXHAUST TEMPERATURE AT VALVES °F
EXHAUST TEMP AT VALVES
SCAVENGE AIR PRESSURE
EXHAUST TEMP AT VALVES
SCAVENGE AIR PRESSURE
FUEL CONSUMPTION
FUEL CONSUMPTION
TP 4009
B.M.E.P. - LBS. PER SQ. IN

Performance curves. Turbo-charging improved specific fuel consumption over the whole bmep range.

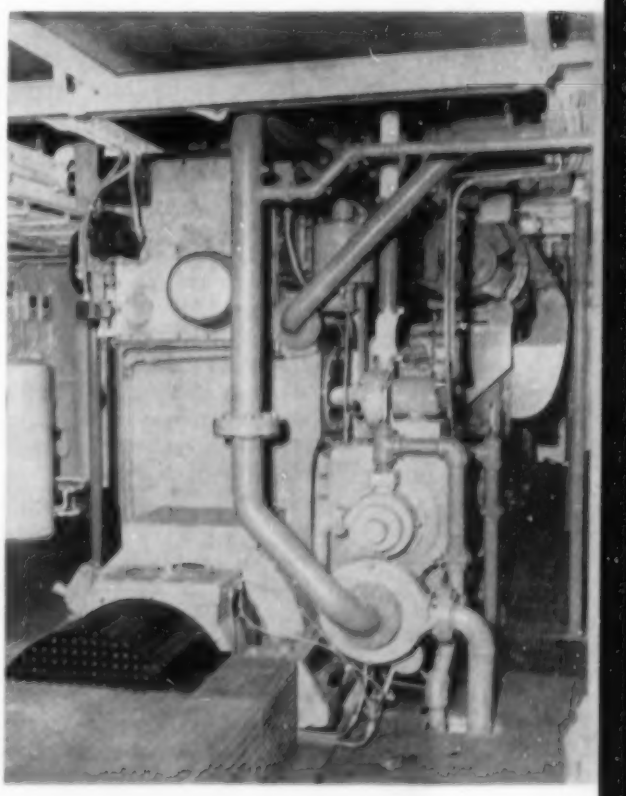


After end of engineroom showing Quincy maneuvering air compressor and Commercial Michiana lube oil filter.

Of considerable practical value is the owner's views on fuel consumption. Bud Shelot told me the consumption for main and auxiliary engines and galley stove totals only 37 gal per hour towing 6000 to 7000 tons at 3 to 4 mph upstream. Incidentally, the fuel capacity in built in tanks is 15,000 gal. Returning to the graph, we note an indication of scavenging air pressure increase with load increase, characteristic of turbocharged engines and reflected in the exhaust gas temperature curve showing a reduction of the rate of increase of exhaust temperature with load increase.

In addition to the main engines Kahlenberg supplied the pilothouse engine controls, air horn, air compressor, air silencers, propeller and the propeller shaft carried in Cutless rubber bearings in stern tube and strut. In a boat of the *Sandra Marie's* dimensions with only one deckhouse ingenuity is required to provide comfortable quarters for a crew of 12 men, which is the number carried. There is a spacious well furnished stateroom for each two men, two showers in the bath area and individual lockers for each of the men. The galley is well equipped with Webbperfection oil burning range, 12 cu ft electric refrigerator, large food freezer, handy racks for dishes, ample food storage space and the dining alcove has comfortable seating at a fairly large table. Electricity to operate the galley equipment, light the vessel, power the electric-hydraulic steering gear, drive the 2-cylinder Quincy compressor for maneuvering air and to operate various other equipment is supplied by a pair of 35 kw Kohler ac generating sets in which the diesels are Waukeshas and the generators are by Electric Machinery.

Mr. Stearn designed the Logan electric-hydraulic lift for the pilothouse which raises and lowers quickly at the movement of a lever. This verticle movement must not interfere with control of the electric-hydraulic steering gears for the one steering and two flanking rudders and electric power at the pilothouse level. One item of interest in this connection is the flexible control cable made by Controlex for control of the steering gears. Another item equally interesting is the Lincoln electric ac-dc converter which supplies dc to the carbon-arc searchlight and can also be used for welding. There is also an incandescent searchlight. There is an RCA ship-to-shore radio phone and a portable phone by Bell Telephone Co. Regulation running lights are by Perkins. Carbon dioxide fire protection is provided. The design is evidently capable of packing more power. With only one engine the engineroom is roomy. A raised trunk aft gives headroom in a normally cramped space. Hull form is rounded making for a dry boat and easy running. All told the owners seem to be well pleased with their new acquisition of which the designer and the builders may be justly proud.



Lower engineroom view showing Napier turbocharger and the intercooler installation on the main engine. This turbocharger operates on the pulse system and is the only source of scavenging air supply for this 2-cycle diesel.

CANANDAIGUA, N. Y.

Canandaigua's New Diesel-Pump Team Cuts Power Costs. Fairbanks-Morse Opposed-Piston Diesel And Centrifugal Pumps Save 50 Percent. New Electric Pump Improves Efficiency.

THE pumping station at Canandaigua, N. Y., has realized an important reduction in operating expenses and guarded against electrical power failure with the installation of a Fairbanks-Morse 300 hp opposed-piston diesel engine driving a pair of new Fairbanks-Morse 10-in. Figure 5814 centrifugal pumps. Installed in November of 1954 as a standby unit, since the old equipment had been in operation for many years, it soon became evident that a fifty percent saving could be effected when the diesel-driven pumps were operated on a daily basis. An additional saving has been achieved with the installation, in September of 1955, of an 8-in. Figure 5814 Fairbanks-Morse centrifugal pump to replace a thirty-year-old electrically-driven unit. Driven off the same electric motor, the new pump handles an 18.2 percent greater volume and has increased pumping capacity by 500,000 GPD.

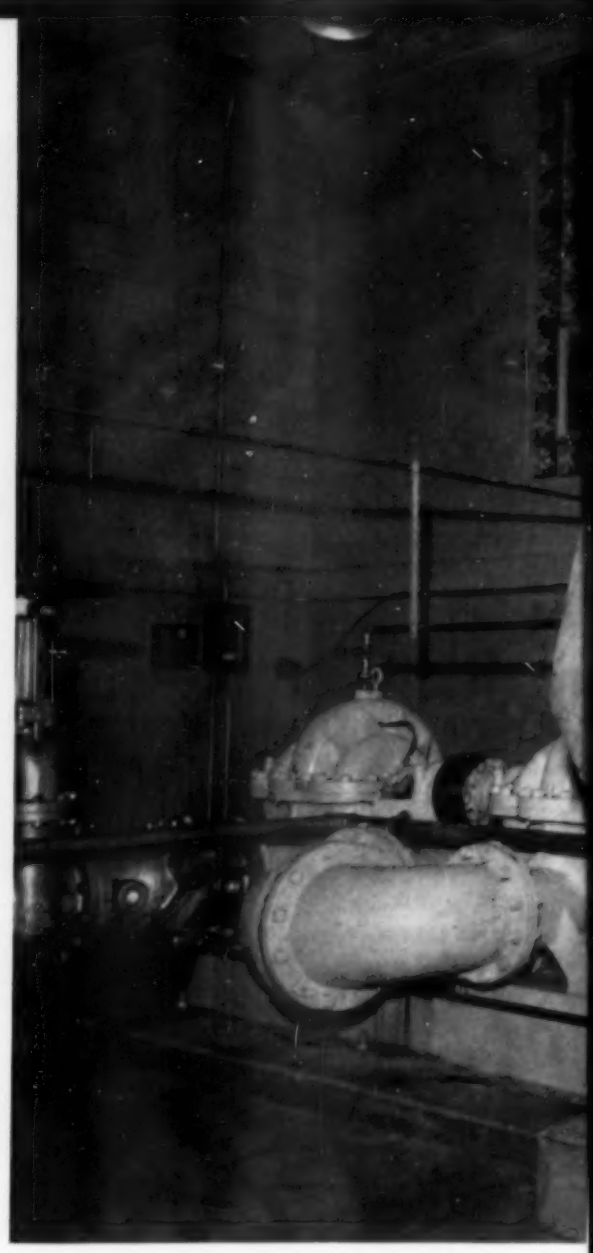
Prior to installing the F-M diesel-driven pumps, the West Lake Road station spent $24.68 for power to pump a million gallons of water, this figure including both a demand charge and an energy charge for electric power consumption. The operating cost of the diesel unit is $12.05 per million gallons, a saving of 51.2 percent. Using production figures for 1955, with the diesel pumps contributing fifty-five percent of the total 668,666,000 gallons, the saving for the year was $4,645. The new F-M centrifugal which was installed in September of 1955 is 18.2 percent more efficient than the pump it replaced. Based upon the cost of electricity per million gallons, this represents a saving of $3.50 for each million gallons of water discharged by this pump. Averaging 2200 gpm, the old unit needed 2280 hours to supply forty-five percent of the total gallonage in 1955. The new centrifugal averages 2600 gpm with the same power supply and required only 1930 hours to pump an equal amount, representing a saving of more than $1,000 in electrical charges during the year.

Canandaigua Lake, nestled in the Bristol Hills in the southwest central part of New York state, is an inexhaustible source of fresh, spring-fed water, supplied by the municipal pumping station to both the city and a large veteran's hospital nearby. Canandaigua has a winter population of 9,000 which swells to more than 15,000 during the pleasant summer months, and the veteran's hospital numbers 3,000 equally divided between patients and staff. All water is supplied by the West Lake Road station, pumping it through a 12-in. and 16-in. pipe to the city and hospital or lifting it through a 16-in. pipe to the reservoir. The reservoir, situated 275 ft above the station and three-quarters of a mile away, holds 4,000,000 gallons, an excellent active reserve supply, since it is sufficient for community needs during a normal two-day period. It is interesting to note that the original cast-iron piping is still in daily operation, and almost no tuberculation has been observed in sections cut out after more than sixty years.

For the new diesel equipment, a building of brick and glass block was constructed adjacent to the old plant. The new building has a sunken floor for more efficient operation, decreasing the suction lift from 15 to 10 ft. The new diesel engine is a Fairbanks-Morse opposed-piston Model 38F5¼ with 5¼-in. bore and a 7¼-in. stroke, developing 300 hp at 1200 rpm. The engine drives the pair of main pumps through a free-wheeling throwout coupling. Therefore, for starting or adjustment, the diesel may be disengaged from the pumps. The two new F-M 10-in. diesel-driven centrifugal pumps operate in series. Designed to pump 2500 gpm at a net head of 304 ft, they have consistently averaged 2800 gpm under actual working conditions. Originally installed only as a standby unit for operation in the event of electric power failure or for peaking periods, this F-M team has been used on a daily basis since the switch was thrown in November, 1954.

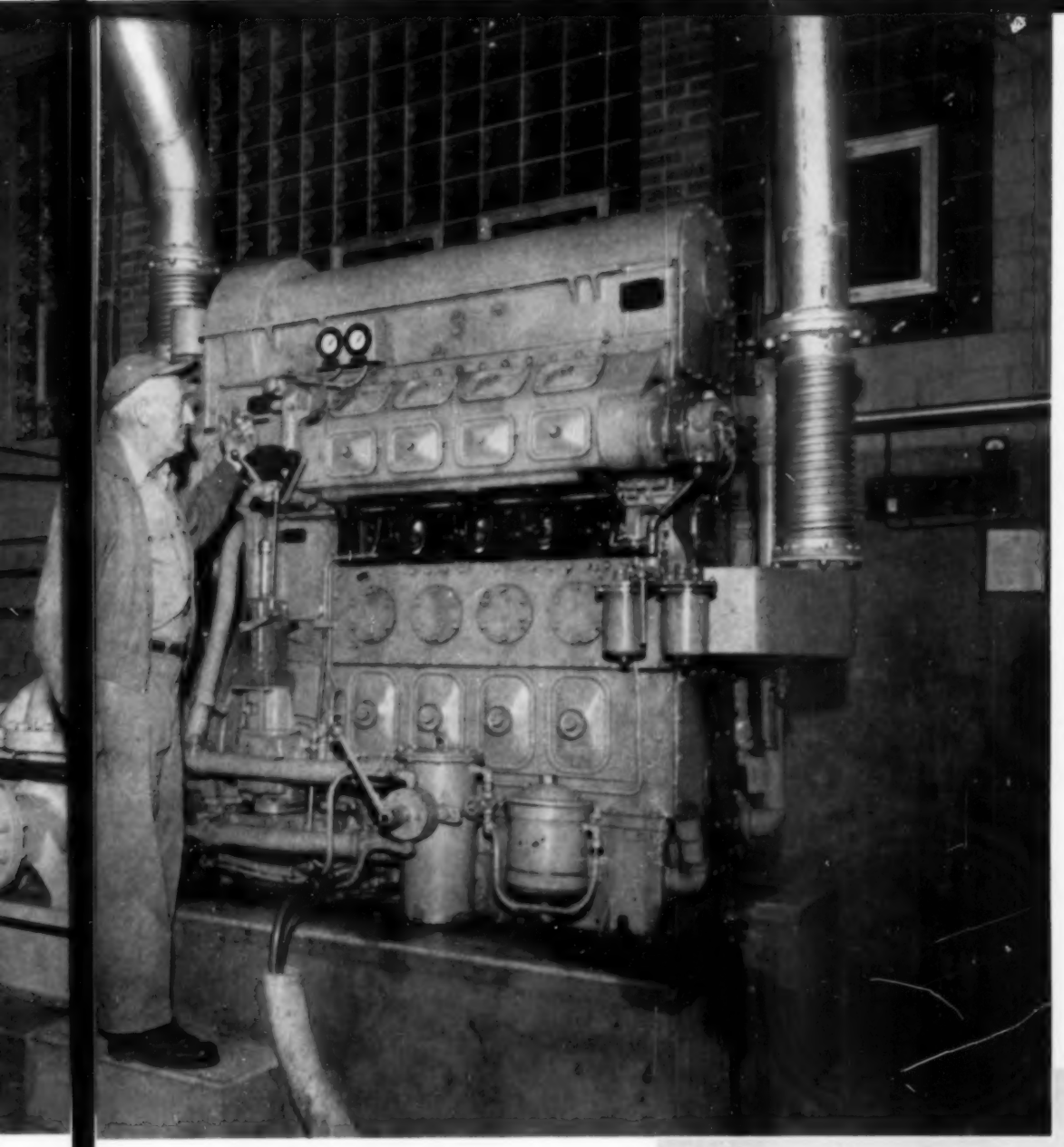
Operating less than half the normal working day of the plant, the diesel-driven pumps have accounted for fifty-five percent of all the water pumped by the station in 1955. In fact, during an extended three month dry period, the diesel unit pumped approximately two-thirds of the water supplied by the plant. On its peak production day in July the station delivered 2,960,000 gallons of water to the city, hospital and reservoir, the diesel unit contributing more than 2,000,000 gallons of this amount. One saving effected by the diesel was the elimination of a demand charge for electric power which had, in the past, averaged $500 a month during June, July and August. This charge is incurred when it becomes necessary to run electric motor-driven pumps during the power company's peak hours. Normally, it was possible for the old pumps to supply the needs and fill the reservoir during off-peak hours, but in the hot summer months, it was necessary to continue pumping during the on-peak period. With the diesel available, it was never necessary to run electric pumps during the utility's peak hours.

Normally, an electric pump is started at 7 a.m. and run till 1 p.m. Then the electric unit is shut down and the diesel run until the reservoir is full, usually 4 or 5 hours. During the summer dry spell of 1955, the old electric pump was operated



for 4 or 5 early morning hours, then the higher-capacity diesel pumps were run from 10 a.m. till midnight.

In September of 1955, an F-M 8-in. centrifugal pump was installed to replace one of the worn, 2200 gpm centrifugals. Driven off one of the old 250 hp electric motors, this pump has been in daily use, the remaining electrically-driven unit used only as a standby. The compact new pump, designed for 2400 gpm at a net head of 304 ft has averaged 2600 gpm in operation, an increase in discharge capacity of 18.2 percent over the unit it replaced. This represents a substantial dollar saving in purchased electric power, and is a significant contribution to the over-all decrease in plant expenditures. In 1955, the West Lake Road station pumped a total of 668,666,000 gallons of water, 12.5 percent more than in the preceding twelve-month period, or an average increase of 6,216,000 gallons per month. During the peak month of July the station pumped 73,348,000 gallons, a 20.1 percent greater volume than the corresponding month in 1954. Community growth, increased per capita consumer demand and expansion of the veteran's hospital have all contributed to the additional 74,590,000 gallons pumped in 1955. Since it was installed, the new diesel engine has been in operation for 2580 hours, and there has never been an engine stoppage.



The station operator throws the lever to start the 300 hp Fairbanks-Morse diesel engine. Driving a pair of F-M centrifugal pumps, also shown, this unit has eliminated demand charges for electric power and insured a continuing supply of water for the community.

Figures for 1955 show that the cost of operating the new diesel engine was $4,493. Of this amount $4,063 was spent for fuel, $350 for lubricating oil and $80 for maintenance. For each million gallons of water pumped by this engine the costs were: $10.90 for fuel, .94 for lube oil and .21 for maintenance, a total of $12.05. Superintendent of Public Works, Rudy K. Genthner, does not figure any additional charges for labor, since the installation of the diesels did not require augmentation of the operating staff. The same men who previously operated the station take care of the diesel as well. Power costs have been reduced 51.2 percent, a saving for the year of $4,645 on the gallonage handled by the diesel-driven pumps. The new F-M electrically-driven pump is 18.2 percent more efficient than the centrifugal it replaced, reducing power costs by $3.50 per million gallons. Supplying forty-five percent of the yearly total, the saving is more than $1,000.

Mr. Rudy K. Genthner, Superintendent of Public Works for the City of Canandaigua, estimates combined yearly savings at slightly more than $5,500. Thus, while assuring the community a continuous supply of water, effectively protected against power failures, the modern plant will pay for itself in a very short time.

LIST OF EQUIPMENT

Engine	Fairbanks-Morse 300 hp, Model 38F5¼ opposed-piston 2-cycle diesel operating at 1200 rpm.
Pumps	Fairbanks-Morse Two 10-in., centrifugal pumps rated at 2500 gpm. One 8-in. centrifugal pump rated at 2400 gpm.
Governor	Woodward
Oil Cooler	Ross
Heat Exchanger	Ross
Air filter and silencer	Air-Maze
Level meters	Levelometer
Lube oil	Super D. Kendall
Lube by-pass filter	Purolator
Lube full flow filter	Air-Maze
Fuel filter	Purolator

The contrast between old and new. On the left is the modern addition to the Canandaigua pumping station which houses the new Fairbanks-Morse diesel unit. The Air-Maze oil-bath filter and the silencer for the diesel engine may be seen on the roof.

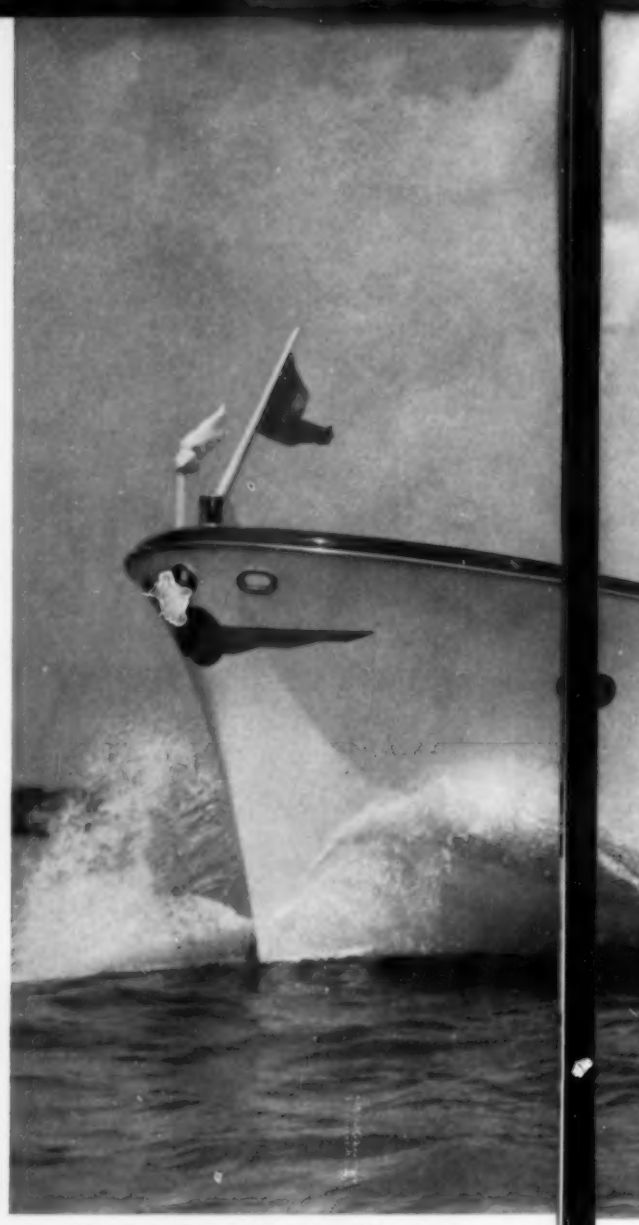
DIESEL YACHT *LADY EVE*

As a spanking new diesel-powered Burger cruiser recently moved out into Lake Michigan headed for her home port on Long Island, her owners were continuing a pattern long established by the American yachtsman. Starting out some years ago with a modest craft, Mr. and Mrs. David Roaman of New York, steadily climbed the yachting ladder and in May had taken delivery of the *LADY EVE*, their "fifth and finest boat."

Named for Mrs. Roaman, who skippers the craft at every opportunity, the *LADY EVE* is a 54-foot steel hull cruiser powered by two 6-71 Detroit diesel engines. The diesels drive two Michigan MP 30 in. x 24 in. three-blade propellers to give the craft a cruising speed of 15 miles per hour. The basic design of the *LADY EVE* was left to her builders, the Burger Boat Company of Manitowoc, Wisconsin but the interior design and appointments were strictly Mrs. Roaman's.

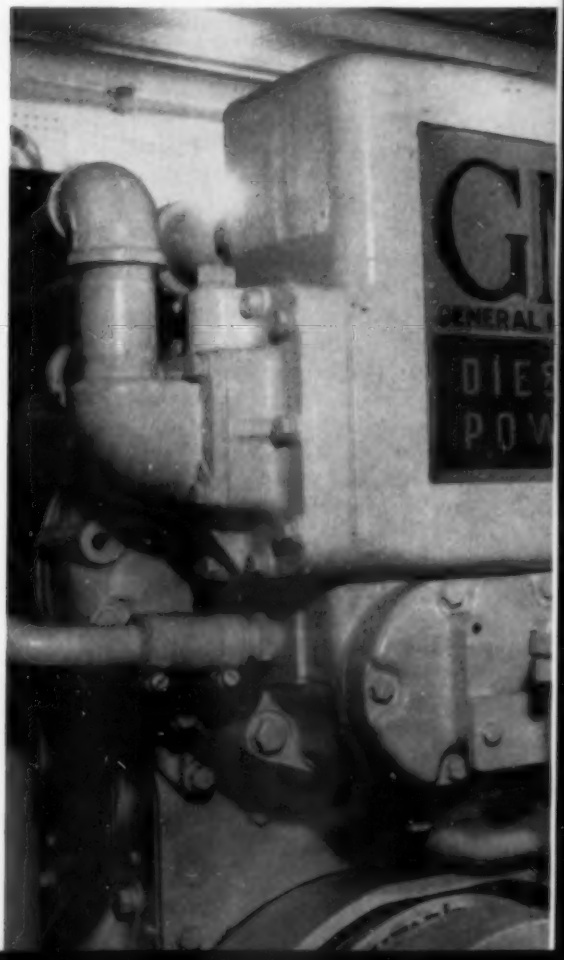
Besides a roomy salon the craft has master and guest staterooms, crew's quarters and complete galley facilities. A large cockpit and deck room forward provide ample space for outdoor living. Equipment includes Panish Positrol controls, Bendix automatic pilot and fathometer, Kelvin-White compass, Onan generator and inter-comm phones. The Roamans will use the craft in Long Island Sound waters and then cruise to Florida and the Bahamas. They are members of the Montauk Yacht Club, Montauk Point, Long Island.

The basic design of the *Lady Eve* was left up to her builders, the Burger Boat Company, but the interior appointments were strictly Mrs. Roaman's. Shown is the forward section of the salon.



The *Lady Eve* on the Detroit River en route to Montauk Point, Long Island.

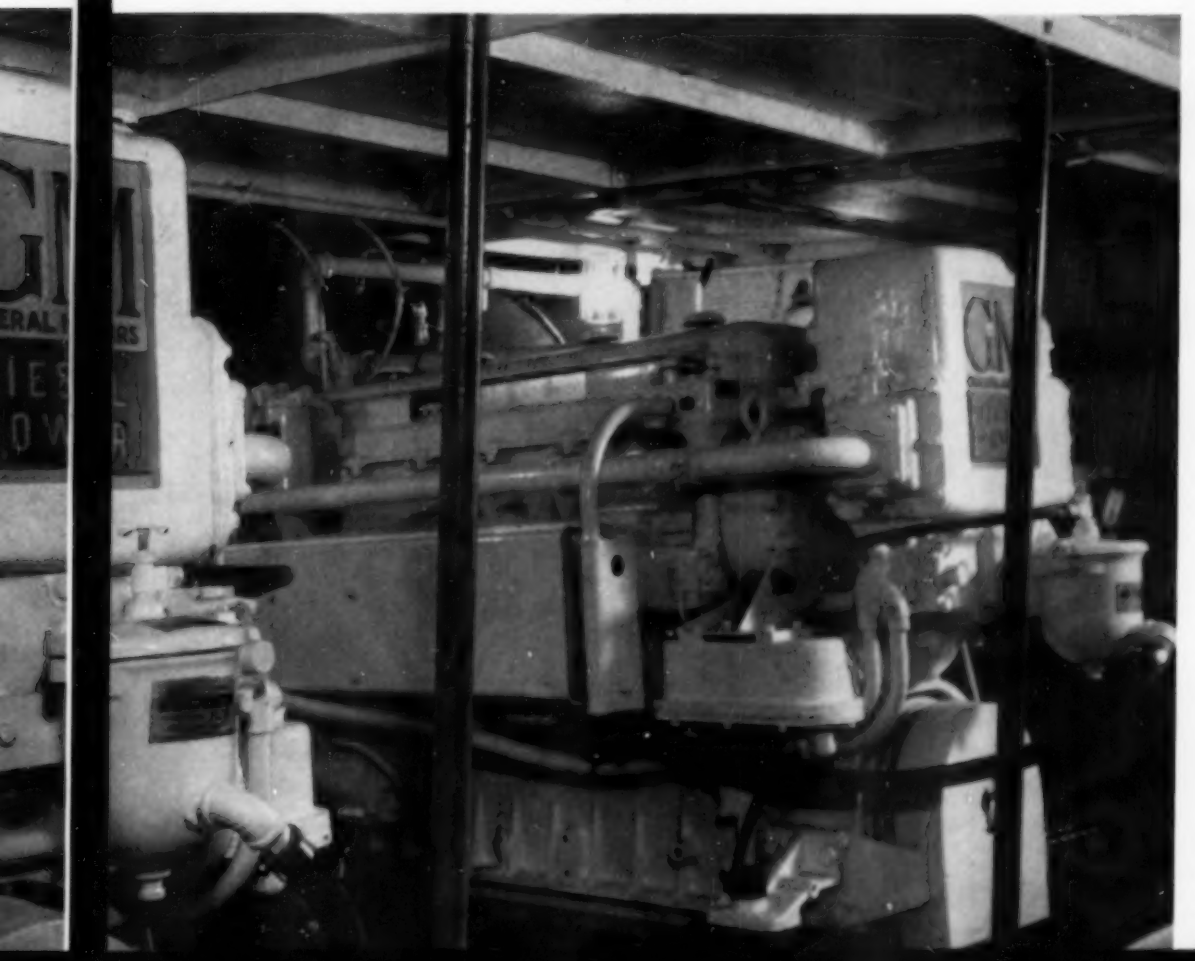
Mrs. Roaman's artistry is revealed in this photo of the dining nook.



Two 6-71 Detroit diesel engines power the *Lady Eve* giving her a cruising speed of 13 miles per hour.

Mr. and Mrs. Roaman aboard their new cruiser the *Lady Eve*. Mrs. Roaman skippers the craft herself at every opportunity.

The *Lady Eve's* master stateroom.



Broadside view of this fine new yacht *Lady Eve*.

DAVID BROWN BRITISH LINE

New 2D Rear-Engine Tractor Gives Recent U. S. Arrival Wide Fields from 12 to 50 HP For Farm, Logging, Dirt Moving and Industrial Jobs.

By F. HAL HIGGINS

DAVID Brown is a name we have been seeing in the British trade magazines with increasing frequency since the war. About five years ago, it leaped the Atlantic to appear in Canadian dress as David Brown (Canada) Limited. Two years ago, a branch of the Canadian company was opened in Oakland, California, to better serve the Pacific Coast, U. S. and Western Canadian territory. By May this year, this Oakland branch was set up as David Brown, Inc., to serve the eleven western states, northern Mexico, Hawaii and the two western Canadian provinces of Alberta and British Columbia.

The writer has been noting the rapid rise of this British manufacturer even before the end of the recent war from the time Shell's British manager gave it such a high rating when over to the U. S. for a business trip near the end of the war. The visit last year of Mr. David Brown to this area when he was invited to speak at the annual Farm Machinery Conference of the University of California and the appearance of David Brown diesel tractors at the Agricultural Engineering exhibit at Davis indicated that here was one foreign manufacturer of tractors that not only had something but was not afraid of competition in offering his tractors to an experienced and calculating buyer of farm power. The recent announcement of the David Brown management in England that the firm is ready with a diesel-equipped rear engine tractor of 12 horsepower made both manufacturer and new model big news in any farm area of the world. So, your Old Reporter made it a point to call on Branch Manager George L. Glover at his Oakland office at the first opportunity.

"David Brown started making tractors in 1936 in an agreement with Harry Ferguson," said Mr. Glover. "Those first tractors were known as Ferguson-Brown, the first being turned out at Huddlesfield, England.

"We went to building the David Brown under its own name in 1938. The first Royal Show to see the David Brown tractor was in 1939. War came along but DB still made these tractors. End of the war in 1946 and the David Brown diesel tractors started to come into production. We made the entire engine, too. The first overseas shipment of David Brown's was in 1947 to Norway. We were building 600 to 800 a year at that date. In 1956 we are building 15,000 to 18,000; probably 9,000 of these being diesel. We still sell gas tractors to New Zealand and Denmark where the farmers get rebates on their gas costs. We also are making kerosene and lamp oil engines for the Middle East.

"Since 1947, David Brown has added a new tractor or something new on the tractors already in production each year. DB was the first company to produce a 30 hp wheel diesel tractor in the world. This was in 1949. One factor in this development is an engine designed for a tractor; not an engine adapted to the tractor from motor truck, auto or marine design. The DB tractors have gone through the NIAE tests in England and some have also been tested in Nebraska. New models are tested each year. From that first export shipment to Norway in 1949, 80% of DB tractors have gone into export fields. They are now found in 73 countries, ranging from Taplan, Norway, to the Antarctic regions.

"The company in Canada was formed 5½ years ago to handle gear and tractor products. From Toronto, the DB Canada, Ltd., serves eastern Canada. DB has been here in Oakland for two years, starting in 1954 as a branch of Canada. On the 30th of April this year, this branch will be split off as David Brown, Inc. We will be moving these premises into a new home at 999 Beeches St., San Leandro. This new set-up will cover the territory of 11 western states, British Columbia, Alberta, Hawaii and northern Mexico.

"Our sales here now are 85% diesel. We started with the gas tractor, however, and after six months got the first diesels. Reason: We didn't want to sell diesels till we had our diesel service installed and ready. Our main sales are concentrated in the San Joaquin Valley around the Fresno vineyards. Reason: The DB 30D is able to pull an 8 ft 3 in. tandem disk to go over the full space between grape rows for a one-trip job instead of two trips over the space to get all the grounds. In field construction tests the DB diesel 30 burns only 1 gallon per hour of 14-cent fuel. The 25D pulling a 6 ft disk was tested for an hour to give a 5-pint consumption. As to prospects for the DB line of tractors and equipment, the West is opening up. When we get production on some of the new DB tractors—row crop available in 4-wheel or 3-wheel, we expect a big business in Mexico. This will be the 30 diesel and price will remain same as now. We have just set up a new distributor with headquarters in Idaho Falls, Idaho. Over 600 people came in to visit the new store resulting in the sale of tractors."

"I still have the Pacific Northwest to set up. The rear engine 2D should have a big demand in agriculture and horticulture. It will have its own DB cultivator and plow. It will mow at about 6 cents an acre. Our once-down-row power meets the problem of hired help that all agriculture is up against in the West. This makes one tractor do the work of two. One secret of the economy of the DB engine is the cylinder head and piston. This style of

David Brown 30D with moldboard plow at work in England. Many of these are already at work in the U. S. A. and Canada.

cylinder design accounts for the very low fuel consumption of the DB engine. DB engines are driving scrap metal cranes in scrap metal yards. They are driving generators for electric power. Pumping in Mexico, powering logging mills. Also two have been installed in taxis to give them 50 miles on a gallon of fuel in England."

"We are developing a high speed diesel around 4,000 rpm. It is now under test and shows more hp and less fuel consumption than the slower speed diesels, believe it or not. It is designed for trucks, but will also go into autos, and tractors. DB was first in England to come out with air tires. First to manufacture 6-speed forward and 2 reverse, 2 speed power take-off, first with air hydraulic controls on 2D. A surprising thing is the maximum torque at minimum fuel consumption is just under rated rpm speed of 1600."

Specifications of the 1956 David Brown Diesel Tractors

2D: *Engine.* David Brown air-cooled 4 stroke 2 cyl. Diesel balanced by idler cyl. Detachable cyl. head carries valve gear. Crankcase with detachable cylinders. Flyweight type governor controls entire speed range of 600/1,800 rpm. Direct injection with 4 hole injection nozzle and engine camshaft driven C.A.V. injection pump fitted with excess fuel starting device. Full-flow oil filter. Oil bath air cleaner. Compression ratio 16:1. Capacity 77 cu in. (1262 cc.). Bore 3½ in. (88-9 mm.). Stroke 4 in. (101-6 mm.). Engine mounted behind rear axle.

Brake hp at 1,500 rpm 12
Drawbar-maximum sustained pull ..... 2,000 lb.

David Brown 30 ITD has winch, arch and bulldozer for logging work. It is finding a place in Western Canadian logging.

David Brown 50D and heavy trailer hauling baled hay.

25D: *Engine.* David Brown 4-cyl. Diesel. Detachable cyl. head carries valve gear. Monobloc with replaceable wet liners. C.A.V. vacuumatic type governor controls entire speed range of 700-1,800 rpm. Direct injection with 4-hole injection nozzle and C.A.V. injection pump fitted with excess fuel starting device. Full pressure lubrication. Oil bath air cleaner. Compression ratio 15.9 to 1. Capacity 154 cu in. (2,523 cc.). Bore 3½ in. (88-9 mm.). Stroke 4 in. (101-6 mm.).

Brake hp at 1,800 rpm	31.3
Belt hp at 1,800 rpm	28.0
Drawbar-max. sustained pull (11x28 tires)	3,650 lb.

30D: *Engine.* David Brown 4-cyl. Diesel. Detachable cyl. head carries valve gear. Monobloc with replaceable wet liners. C.A.V. vacuumatic type governor controls entire speed range of 700-1,800 rpm. Direct injection with 4-hole injection nozzle and C.A.V. injection pump fitted with excess fuel starting device. Full pressure lubrication. Oil bath air cleaner. Compression ratio 15.9 to 1. Capacity 165 cu in. (2,705 cc.). Bore 3-⅝ in. (92-1 mm.). Stroke 4 in. (101-6 mm.).

Brake hp at 1,800 rpm	34.0
Belt hp at 1,800 rpm	31.0
Drawbar—max. sustained pull (13x28 tires)	4,650 lb.

50D: *Engine.* David Brown 6-cyl. Diesel. Detachable cyl. head carries valve gear. Monobloc with replaceable wet liners. C.A.V. vacuumatic type governor controls entire speed range of 700-1,800 rpm. Direct injection with 4-hole injection nozzle and C.A.V. injection pump fitted with excess fuel starting device. Full pressure lubrication. Oil bath cleaner. Compression ratio 16 to 1. Capacity 248 cu in. (4,059 cc.). Bore 3-⅝ in. (92-1 mm.). Stroke 4 in. (101-6 mm.).

Brake hp at 1,800 rpm	50
Belt hp at 1,800 rpm	48.1
Drawbar-max. sustained pull (14x30 tires)	6,550 lb.

The two larger sizes of David Brown diesel tractors are offered in crawler as well as wheel models to meet the need of western farmers with all-year work and problems of terrain. The David Brown line of implements to team with its tractors is complete for general farming with some 60 different tools of their own make plus many "associated implements" built by other British and U.S.A. firms. The bringing of diesels down to the small farms specializing in vegetables, fruits and poultry ahead of other tractor builders immediately opens up a rich field the manufacturer is sure to find almost insatiable for the next few years. Ever since Allis-Chalmers appeared early in the recent war era with its rear engine Model G, users have been yelling for the same idea in a bigger size. The emphasis on accurate planting and cultivation make rear engine 2D a natural. The diesel engine makes it a bullseye.

GIANT OF THE GULF

By JAMES L. LESLIE

Near the mouth of the Mississippi River, north of Pass A Loutre, is a hulking giant of the oil drilling business—California Company's elevated deck drilling vessel, the S-55. A product of California Company engineers and the New Orleans firm of Friede and Goldman, Inc., the S-55 is one of the largest elevated barges of its kind ever built, and cost, including rig, is in excess of $3 million. Today the S-55 is a beehive of activity, containing everything from a helicopter landing deck to a recreation room and air-conditioned comfortable quarters for its crew. The enormous barge was built by Avondale Marine Ways in New Orleans and was hailed at its launching recently as another milestone in the continuous battle for the huge offshore oil reserves off the coast of Louisiana.

It is significant that oil producers are relying on ever-bigger and ever-better designs for offshore barges. The California Company's sister company, The Standard Oil Company of Texas (another subsidiary of The Standard Oil Company of California) is operating Zapata Off-Shore Company's mobile platform, *The Scorpion,* described fully in DIESEL PROGRESS in June, 1956. *The Scorpion,* a product of the R. G. LeTourneau, Inc. firm of Galveston, was designed as a three-legged movable spud barge, while the S-55 is a traditional fixed column barge. Despite a friendly rivalry among engineers, there is a feeling among producers that the industry can use both.

Unlike *The Scorpion,* whose hull also serves as its drilling platform, the S-55 consists of a barge which is the base for mounted fixed columns reaching up to support a completely self-contained drilling platform. When the S-55 is on location, the barge is submerged and becomes a foundation for the platform. From top to bottom, this powerhouse is the size of a 10-story office building. The fixed columns, themselves, are 96 ft tall, according to California Company engineers. In the interest of economy, the S-55 does not become a permanent platform barge. Its operation and upkeep would not justify it at the present time, the statisticians report. So when a well spuds in, and has been completed, the big outfit is moved to another location while crews of workmen drive piling and set up equipment for a small permanent producing platform. However, if it is deemed advisable, the S-55 can drill directionally and bring in several wells from its one location.

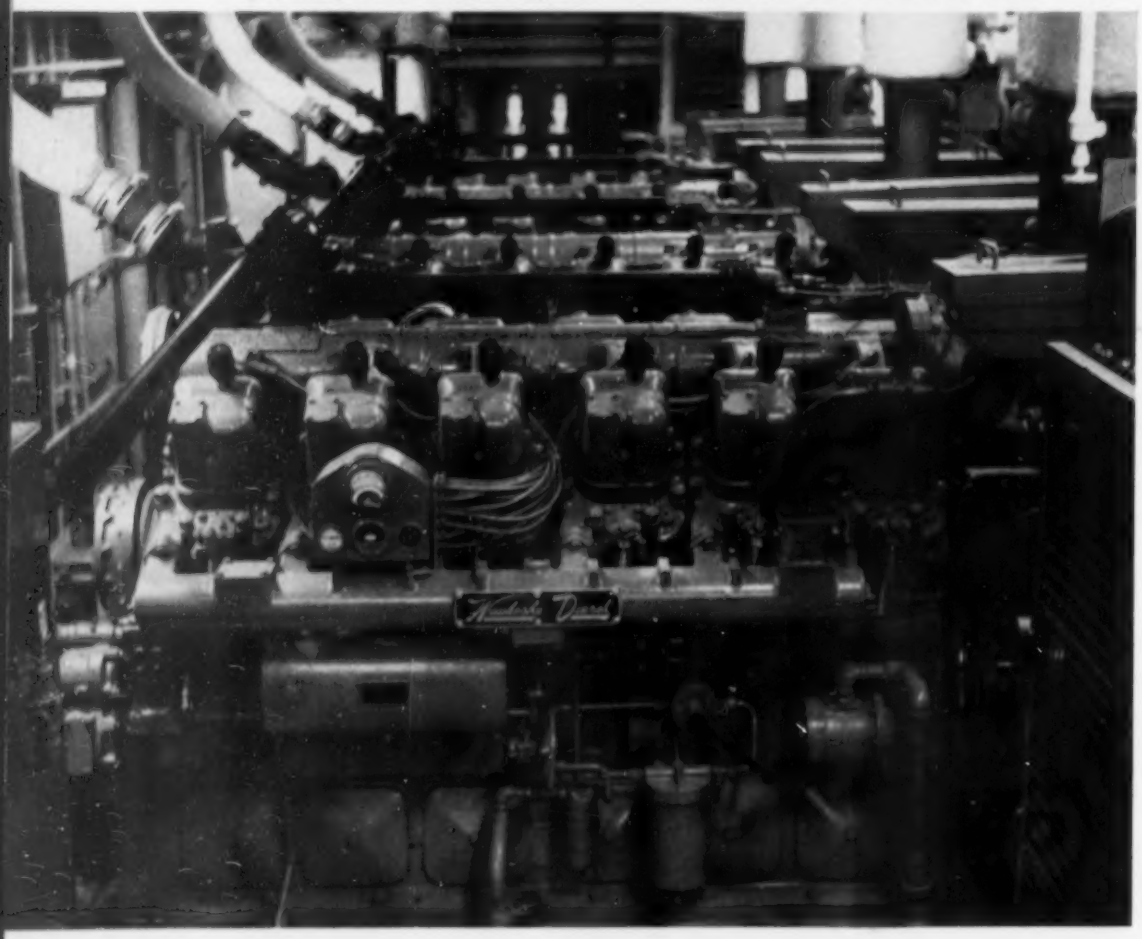
The S-55, under tow, has a draft of only 6 ft, 6 in. This is a rather surprising fact, considering that other smaller barges have drafts ranging up to 5 ft deeper. The submersible barge is wide enough and long enough to spread the tremendous weight around. The barge is 190 ft long and 150 ft wide. The hull is 12 ft thick, thick enough for storage and to support the 10 fixed steel columns. Although they aren't the main basis for the barge, the S-55 has its retractable feet, too. The feet for the S-55 are hydraulic rams, two each in four recessable hydraulic pontoons fitted onto the barge. These pontoons are held to the floor of the ocean by the rams, while the barge is either raised or lowered, thereby giving it maximum stability.

The engineering firm and the company engineers had some enormous problems to overcome before the S-55 could become a finished product. An example of this is the fact that the barge was so huge it could not be launched from Avondale's conventional ways. Since Avondale obviously could not go to the expense of enlarging its launching system, the S-55 had to be launched in sections. The main hull member, the central section, was built first and launched. The remaining two sections were launched independently and later welded to each side of the central section, making the complete hull. After the platform was constructed and the barge was completed, it underwent a series of tests in the Mississippi River near the Avondale Ways. Finally, the Barge was formally christened and floated down the river to its present location.

Like its predecessors, the S-44 and S-45, the S-55 makes use of conventional drilling equipment on the mounted platform. The Noble Drilling Corporation, which presently holds the drilling contract, is using a draw works and rotary table manufactured by National Supply Company and a derrick and substructure made by Lee C. Moore. The derrick is 146 ft high. The earlier California Company barges were nicknamed the *Kildees* for the long-legged birds. When the S-55 was built, there was no hesitation about a name. It was tabbed the *Super Kildee.* When the S-55 is in operation, almost all machinery, except for drilling equipment and the power plant, is underwater, being housed in the barge.

All generating power is furnished by diesels. Four identical Waukesha Model VLR DBS diesels furnish the horsepower for 8 big generators; while a Waukesha Model LRH diesel, rated about 250 hp furnishes standby power for the auxiliary 125 kva ac generator. The Waukeshas were purchased from the Reagan Equipment Company of New Orleans and are vee type diesels with 12 cylinders and an 8½ in. x 8½ in. bore and stroke. Each engine has a displacement of 5788 cu in. and is rated 1135 hp at 1200 rpm. The engines furnish plenty of power in a compact package and are equipped with turbochargers and American-Bosch fuel injection systems. The engines are cooled by

View of the four Waukesha V-12 turbocharged 1135 hp diesels that provide the power for the S-55. Note the clean, compact design of the engines, which feature high horsepower output with small space requirements. Alnor pyrometer can be seen in foreground.



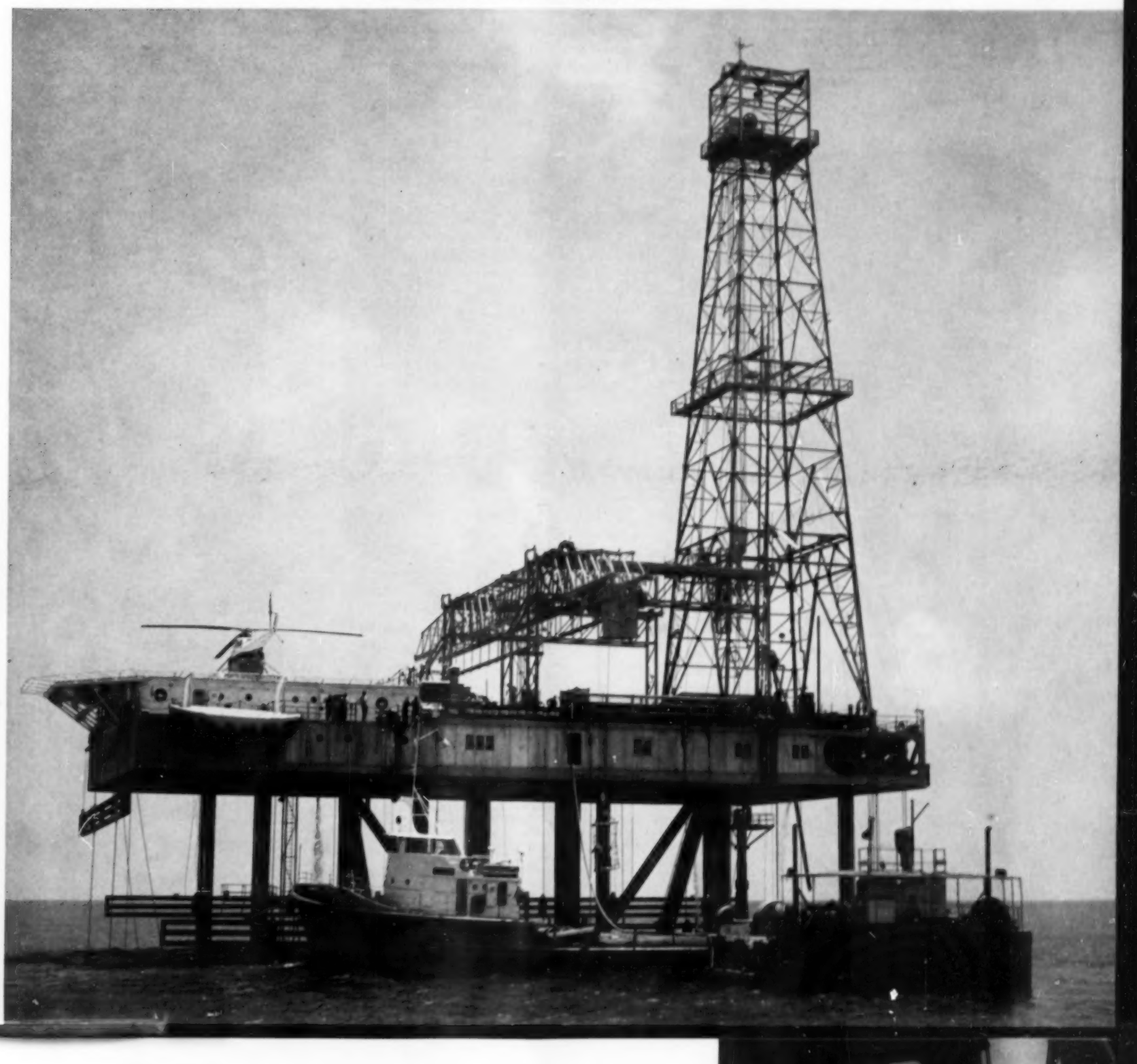
fresh water from heat exchangers. They are also equipped with spark-arrester mufflers.

There are five distinct in-line arrangements of engines and generators. Four of the arrangements are powered by the identical Waukesha vee type diesels, while the fifth, the standby unit, is powered by the LRH. In each of two arrangements, an engine is connected to a pair of 600 kw dc generators, while the other two arrangements consist of an engine connected to paired 600 kw dc and 400 kw ac generators. The generators connected to the main Waukesha engines at no time pull more than the power output capacity of the engines, but are arranged so that they can be used in parallel with other in-line arrangements and provide a maximum of flexibility to meet the power requirements of the rig. Only the power that is needed is sent out at any time, and the extra capacity of the generators is only to provide flexibility in power output.

A Cummins JBS 150 hp diesel with Allison torque converter powers the highly mobile well surveying unit on the deck of the drilling platform. The unit, a Schlumberger, will perform well under almost any kind of weather conditions, engineers say. The barge's G-1000 mud pumps were manufactured by National Supply Company and are powered by electric motors having a hp rating of about 700. Other equipment throughout the rig is also powered by the electricity generated by the main engines. There are three bow winches and they are Markey type Tess-24 with 50 hp rating. The mud mixers were made by the Mixing Equipment Company and are Lightning model TEQ with 5 hp, 60 cycle motors. The air-compressors are among the most vital components of the barge since they provide the impetus needed to start the engines and also are valuable in other capacities on the platform; they are driven by two General Electric 15 hp electric motors. The standby engine for the compressors is a Fairbanks-Morse Model 45 diesel, rated at 10½ hp.

The S-55's crew and supervisory personnel find that life aboard the barge is pleasant. Both the offices and crew's quarters are air-conditioned, the food is good, and there is a large recreation room. Some personnel are flown to the barge by helicopter, making the offshore distance no problem.

This is the S-55 *Super Kildee* as it looks today at its location at the mouth of the Mississippi River north of Pass A Loutre described technically as Main Pass, Block 40. A complete island city, the S-55 was towed to its present site. A barge, upon which the drilling platform and derrick rest, is submerged.



INDIANAPOLIS-KANSAS CITY EXPRESS REPOWERS WITH DIESELS

By L. H. HOUCK

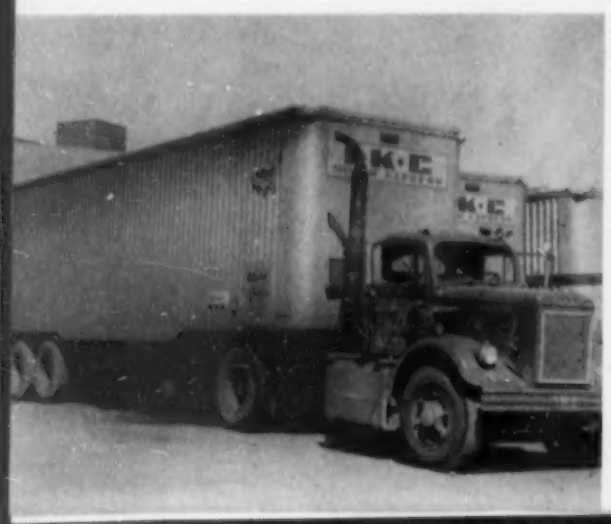
AN outstanding diesel repowering project has just been completed by the Indianapolis-Kansas City Express Co., with headquarters in Kansas City, Mo., on its Kansas City to Indianapolis run. Thirty-two gasoline tractors used on this run were replaced with 16 diesel units. The new diesel tractors have potential load capacities of 20 per cent more and a rearrangement of layover point resulted in a reduction of 10 hours in running time which makes express freight movement both ways between these two points one of the fastest in the country. Six-foot Albert A. Fowler, president, who started as a railroader, worked on a Kansas City freight dock, and spent three years in a transportation unit of the U. S. Quartermaster Corps, hauling supplies from the Persian Gulf into the Caspian Sea area of Soviet Russia in World War II, started his truck line in 1945 with four trucks and eight men. By 1946 his assets amounted to $25,000. Now the line commands assets of more than $2 million with a payroll of more than 300 men and women.

The diesel changeover just completed consists of 10 White 9000 tractors with HRFB-600, Cummins 180 hp naturally aspirated engines, with the combination carrying the White designation of 96000. This engine has been turning in a good job on the Indianapolis-Richmond portion of the route. Six gasoline tractors were repowered with the Cummins turbodiesels, the 175 hp JT-6-B. These 16 units replaced 32 gas units and carry the same amount of freight faster and when new high cube trailers are added will carry about 20 per cent more freight. Under the gasoline setup, Edwardsville, Ill., was the layover point and 16 trucks were domiciled at Kansas City and 16 units domiciled in Indianapolis and trailers set eight hours while drivers rested. The layover point was changed to Springfield, Ill., with the introduction of the 16 diesel units with tractor and trailer running clear through from Kansas City to Indianapolis by changing drivers at Springfield. So each tractor and trailer leaving Kansas City now makes a full round trip which rolls up 1000 miles in about 30 hours. Only stop on the round trip besides the layover point for relief driver is a fueling stop. All service is handled in the Kansas City shop for these new units which is under the supervision of Carl Wilson, maintenance superintendent.

While some of the trailers now being pulled are 32-ft trailers, the line is going to 35-ft high-cube trailers. The White tractor which measures only 90 in. from front bumper to back of cab and provides kingpin settings of 24, 30 and 36 in. pulls a 35 ft trailer in a total length of 45 ft. This is important in Missouri where both front axle loading and axle spacing are important factors as well as in Illinois and Indiana where front axle loading is more important than axle spacing. The com-

Running the rack on diesels at I-K-C. This routine maintenance operation is scheduled for 13,000 to 15,000 mile intervals and includes valve lash check, injector timing. Injector screws are set with tension wrench.

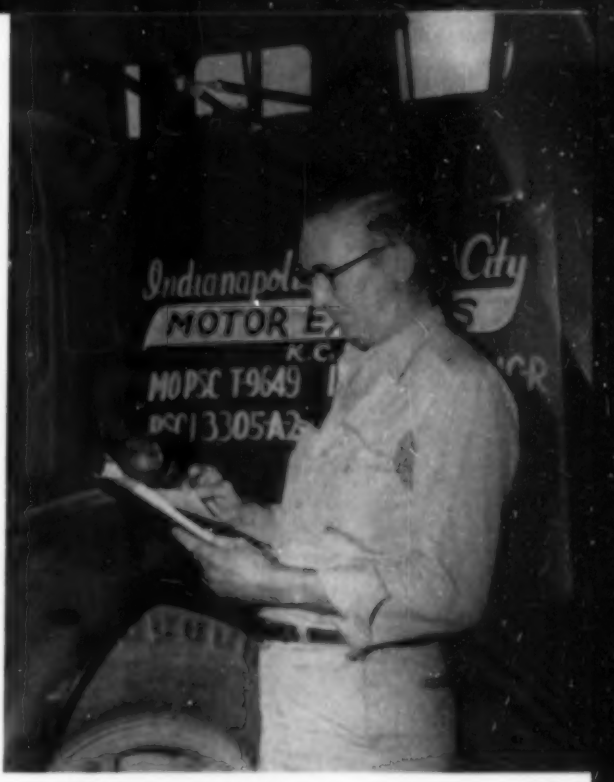
Albert A. Fowler, president Indianapolis-Kansas City Motor Express is the driving force behind the change over to diesels.



Indianapolis-Kansas City Motor Express Company's White 9000 tractor with Cummins HRFB-600 diesel engine, naturally aspirated, rated at 180 hp. This tractor has only a 90 in. dimension from front of bumper to back of cab and handles 35 ft square corner trailer in 45 ft with kingpin settings of 24, 30 and 36 in.

bination makes possible the highest tonnage under existing regulations with the diesels giving plenty of power to handle the loads at maximum legal speeds. As with all changeovers from gas to diesel some personality problems are introduced. Truck drivers need some diesel instruction but in the case of I-K-C the transition was an easy one with all the drivers liking the extra power. For example one of their most powerful rigs in the gas fleet was a 500 cu in. engine which is now placed in standby use. Now when it has to be used while a diesel is being serviced it generates an occupational disease commonly known as belly-aching. Mechanics took over the new diesels in their stride, according to Carl Wilson, maintenance superintendent, and there have been changes in routine preventive maintenance programs.

Little new shop equipment has been added because work has just been started on new offices, shops and freight docks at another location. When this is completed the new diesel fleet will be serviced in a streamlined efficient diesel service shop. At 80,000 miles which have been turned upon some of the units, repairs have been nil and maintenance only routine. Fuel consumption is being charted at better than 6 mpg. Particular attention is given to servicing air and lube cleaners, both of which are mounted outside the engine compartment for easy availability. Each White is equipped with a 750-C Luber-finer lube oil filter mounted on the left side. The air cleaner is a Donaldson oil bath type and is mounted externally on the right side. This gives outside cooler air for the engine's breathing. Air brakes use a Bendix-Westinghouse air compressor mounted on the engine.



Carl Wilson, maintenance superintendent, Kansas City shop, checks new engine specifications.

Air Cleaner is oil bath type and mounted outside engine compartment where it picks up cooler outside air for the engine. It is made by Donaldson.

Left side of White 9000 diesel. Bottom box is for batteries, top tank is auxiliary fuel tank; brake's air cylinder sets in recess in back of battery box and air line is protected against road by a shield. At far left is externally mounted oil filter, a 750-C Luber-Finer.

Close-up of an up-rooted tree being bull-dozed out of the way of the next operation by the International Harvester TD 24 diesel tractor with dozer. The big diesel in this tractor provides plenty of power to muscle around big trees like this one.

TREE REMOVAL WITH DIESELS

By J. W. BROWN

WHILE it is not a job that Joyce Kilmer, author of the famous poem *Trees* would have cared for, tree removal on a wholesale, contract basis is providing a living, and a pretty good one, for C. F. (Slim) Rosencrans and his crews of the Dundee Tree Service of Dundee, Michigan. Mr. Rosencrans has built up quite a clientele among contractors in eastern Michigan, handling the removel of unwanted trees on a sub-contract. When large industrial plants are built or new roads constructed in areas covered by heavy second-growth timber, as is most of Michigan, the trees have to come out before much else can be done. Using Dieselized equipment, Dundee Tree Service crews (of which there are currently 6 in operation) root out trees up to two feet in diameter, usually without preliminary digging. All sawing is held up until the trees are downed at which time usable logs are bucked into sawmill lengths with Homelite gasoline saws, and the rest is bull-dozed into piles or windrows for later burning. Harder-to-burn stumps often have to be hauled away by truck or low-boy to a fill area for disposal.

Among the equipment Dundee Tree Removal has used in this work are Allis-Chalmers HD-11 and HD-19 tractors, International-Harvester TD-6, TD-9 and TD-18 tractors, a Bucyrus-Erie ¾ yd diesel crane and an Insley gasoline-engine powered crane. Mr. Rosencrans' current favorite for knocking trees down is an International Harvester TD-24 tractor which weighs approximately 53,000 lbs with hydraulic dozer and winch. It was recently purchased from Wolverine Tractor Company of Detroit and Grand Rapids, Michigan.

THE MV *THOMAS NELSON*

By ARNOLD B. NEWELL

IN the Motorship *Thomas Nelson* it would be difficult to recognize an original Liberty Ship. This vessel is one of four in a program of experimental modernization with a view to determining the desirability of making changes in hull lines to improve sea-keeping qualities and to achieve the minimum desired speed of 15 knots with alternate power plant schemes. One plan steps up the power of an unchanged Liberty Ship from the original 2500 ihp to 6000 shp with a steam turbine; the second is the *Nelson* with a pair of 3125 hp diesels driving a single propeller through electro-magnetic couplings and reduction gearing; the third installation is a regenerative rotary compressor open cycle gas turbine with reduction gear and controllable pitch propeller; and finally the fourth is a free-piston gas generator and turbine installation with reduction gears and a reverse operating element in the turbine. The MV *Thomas Nelson* is one of the two ships employing conventional machinery not of an experimental type. The other is the steam turbine in the *SS Benjamin Chew*.

As most people know, Liberty Ships were built quickly and inexpensively as dependable, seaworthy vessels with a speed of 10 knots to serve a great need in time of war but not very useful thereafter. The before-and-after dimensions of the ship are tabulated herewith:

	Original	Modernized
Length	416 ft	441 ft
Beam	56 ft 10 in.	same
Depth to upper deck	37 ft 4 in.	same
Draft	27 ft 6 in.	26 ft
Displacement tons	14,250	13,570
Deadweight tons	10,800	8,970
Speed	11 knots	17.5
Horsepower	2500	6250

The successful bidder for conversion of the *Nelson* was the Bethlehem Steel Company's Key Highway Shipyard in Baltimore. The propulsion engines are Baldwin-Lima-Hamilton 2-cycle trunk piston type, 7-cyl., 21½ x 27½ in. bore and stroke, with a normal power rating of 3300 hp at 260 rpm. The reduction gears and electro-magnetic couplings are made by Westinghouse, the gear ratio being 2.6:1. The new shaft line and propeller assembly is all by the Bethlehem Steel Company. In order to bring about the changes the old bow was removed and one of new design was added. Machinery space in the ship was stripped of all existing equipment but the fuel tanks were left undisturbed, including heating coil and the settling tank in the wings of the engineroom. Quarters and navigating equipment remained substantially unchanged but hatch covers and cargo gear and deck machinery were modernized.

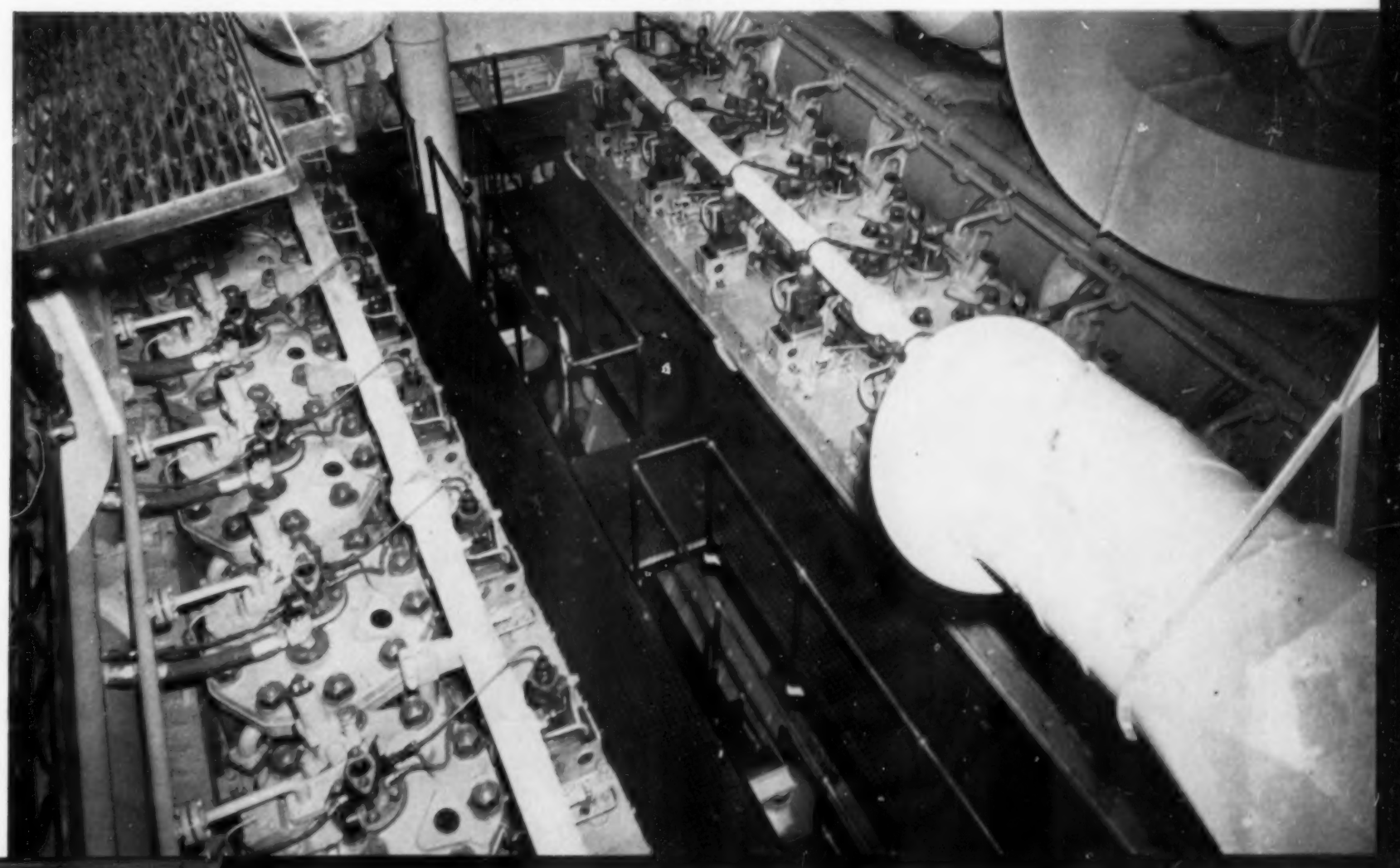
It should be noted at the outset that an important Maritime Administration stipulation regarding all new propulsion machinery was that it must burn heavy residual fuel because the price is much lower. It is the desire of the Administration to demonstate to American ship operators the feasibility of heavy fuel by accumulating accurate fuel economy data under carefully controlled conditions. An indication of the gain from the viewpoint of fuel prices is given in the following table of recent quotations on marine diesel vs. marine residual fuel oil.

	Cost per bbl	
Port	Fuel oil	Diesel fuel
Philadelphia	$2.65	$3.99
Baltimore	2.65	3.99
Beaumont	2.20	3.95
Kingston, Jamaica	2.60	4.10

When diesel propulsion is employed, the higher cost of regular diesel fuel tends to nullify the advantage of high thermal efficiency and correspondingly low rate of fuel consumption, constituting economic advantages when the same grade of fuel is used in both types of machinery. Provisions for burning residual fuel is of considerable interest and importance, and will be touched upon at greater length later.

In general the machinery installation is conventional, simple, practical and without any element that might be called an experiment, with the pos-

Looking straight down into the engineroom from the skylight above.



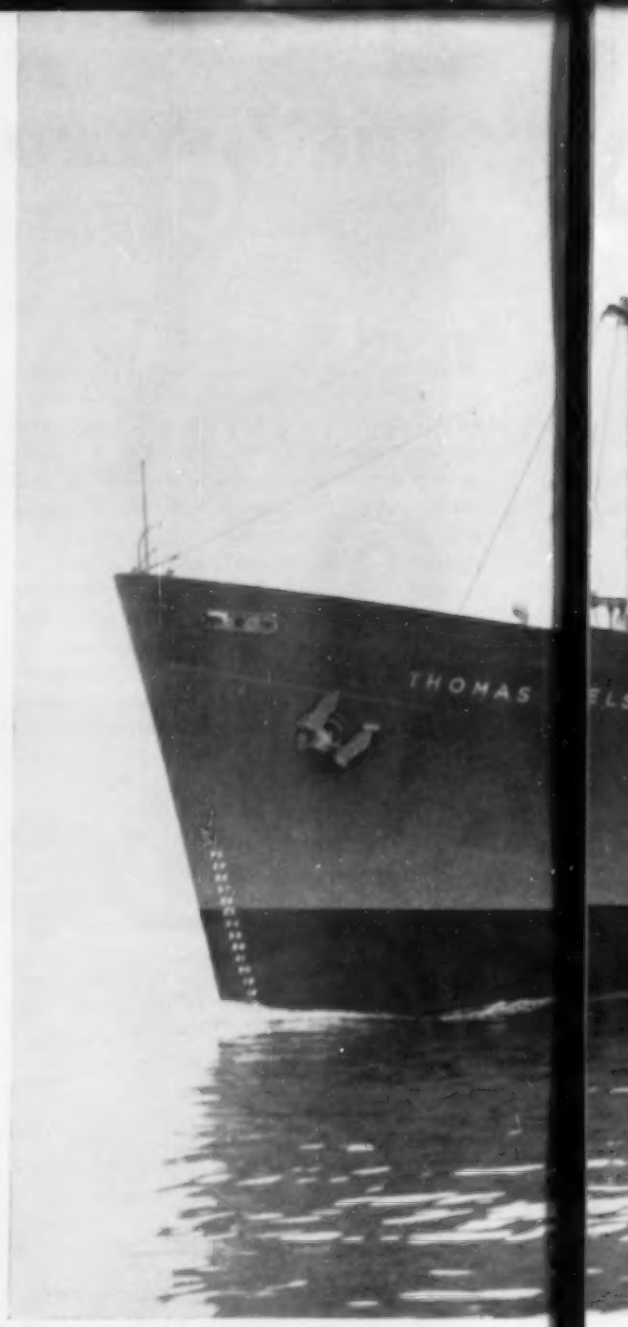
sible exception of a gas turbine driving a fire pump located in the shaft alley. It has been possible to make the 6250 hp diesel installation in the machinery space formerly occupied by the 2500 hp steam plant which, however, was of inherently heavy and bulky type and therefore not suited to use as a basis of comparison. The B-L-H trunk-piston diesels, the Westinghouse gears and the electro-magnetic couplings all have been tried and demonstrated in services of many kinds—nothing experimental here.

The model of Baldwin-Lima-Hamilton engines installed is well known. However a brief description is in order. Of trunk piston 2-cycle marine type it is built in 5 to 9-cylinder models. The range of power at 260 rpm is from 2450 to 4410 bhp. There is a welded steel bedplate, and upper base supporting a cast iron cylinder block and the three are held securely with tie rods. The cooling system is conventional. Pistons are oil cooled 2-piece design and skirts carry Allan metal wearing inserts. Precision bearings are lined with Satco. American Bosch individual fuel pumps are installed at each cylinder. Scavenging air is provided by a pair of positive displacement type blowers on each engine made by Roots Connersville. A distinctive design characteristic of these engines is loop scavenging and a rotary valve in the exhaust which entraps 40% more air in the cylinder after the scavenging process is completed with corresponding increase in power output. The governors are made by Woodward and the pyrometer system for checking exhaust gas temperature is Alnor. Propeller rpm is indicated by Electric Tachometer Corp. tachometers while the engine tachometers are by Jones Motorola.

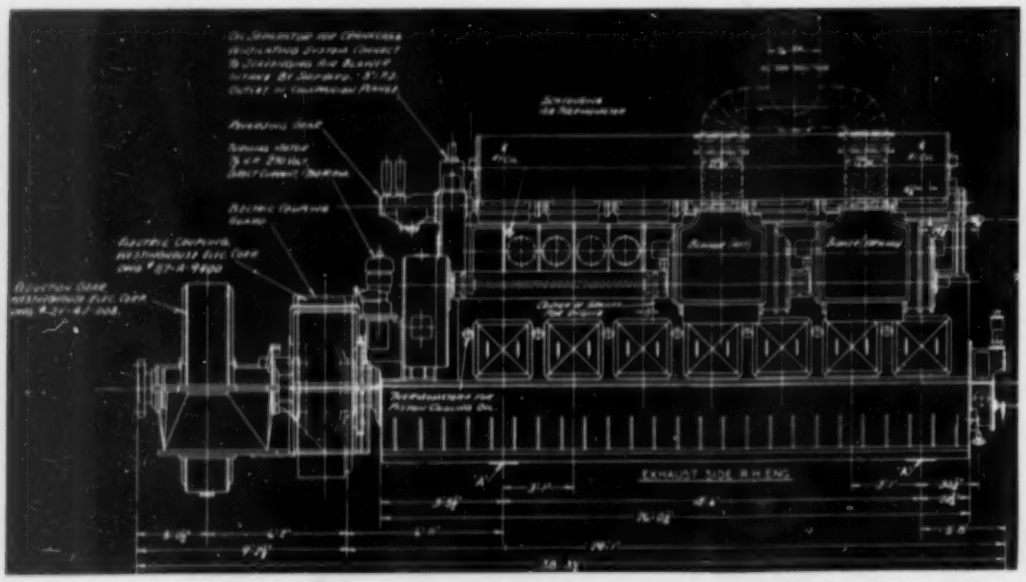
The engines are directly reversible, capable of being separately connected to the propeller if so desired. They are fresh water cooled. There are three separate lubricating systems, complete in all details—one for each main engine and one for the gear set. The main engines are pressure lubricated and the gear sets are fed by gravity from an overhead tank. There is a 3-compartment lube oil tank at the 'tweendeck level forward in the engineroom. One compartment is for fresh new oil, one is for purified oil and one for oil pumped out of the systems to be held, as in port while working on the engines or at sea for processing. Purification is through the use of three Sharples centrifuges upon which along with a lube oil filter in each engine's lube oil system, complete dependence is placed to maintain the oil in good condition. Each separate system has its own motor driven Sier-Bath rotary pump and shell-and-tube type heat exchanger made by Thermxchanger, Inc. Incidentally, there are two lube oil pumps on the gear sets, one for service and one for standby. It is obvious, of course that the lube oil heat exchanger system also dissipates heat picked up in the pistons by the oil cooling arrangement.

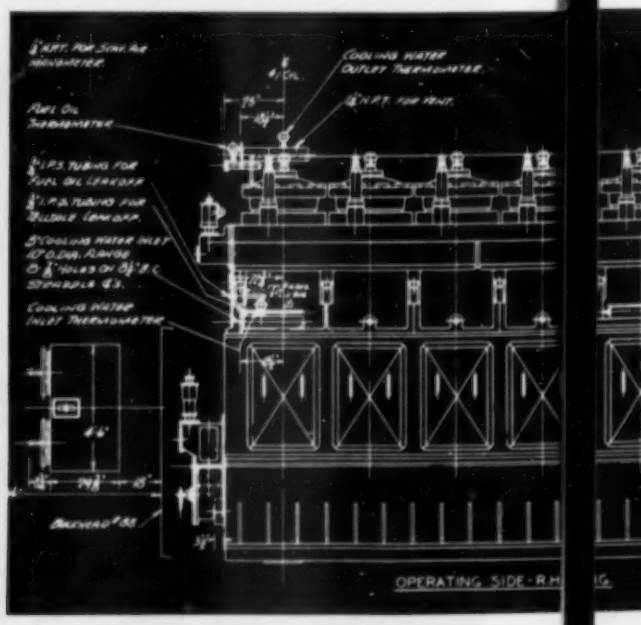
In order to avoid repetitions of descriptions it is worth mention that all oil pumping is done with verticle motor driven Sier-Bath rotary pumps and the circulation of water is by verticle, centrifugal type, motor driven Aurora pumps. There are three of these in the fresh water cooling system and three sea water pumps, thus providing one standby for each service. In addition there is a bilge and ballast pump driven by a 15 hp motor and a combination fire, sanitary and ballast pump driven by a 50 hp motor. The motors on these pumps are General Electric. Deming furnished the wash water pump. There are two systems of building up compressed air for starting. One is an 8 hp Lister Blackstone single cylinder diesel that can be started by hand cranking, driving a small Worthington 2-stage compressor. This is an emergency unit. The main compressors are a pair of 3-cylinder Gardner Denver units each driven by a 50 hp G. E. motor. In this instance we note the trend away from loading the main engines with attached auxiliaries and the more extensive use of electric drive throughout.

The exhaust system is of interest in that it has a bearing on over all economy. A Foster Wheeler exhaust gas boiler is installed in the exhaust lines for both engines and has a single outlet to the stack. It also acts as a silencer. Inherent in the de-

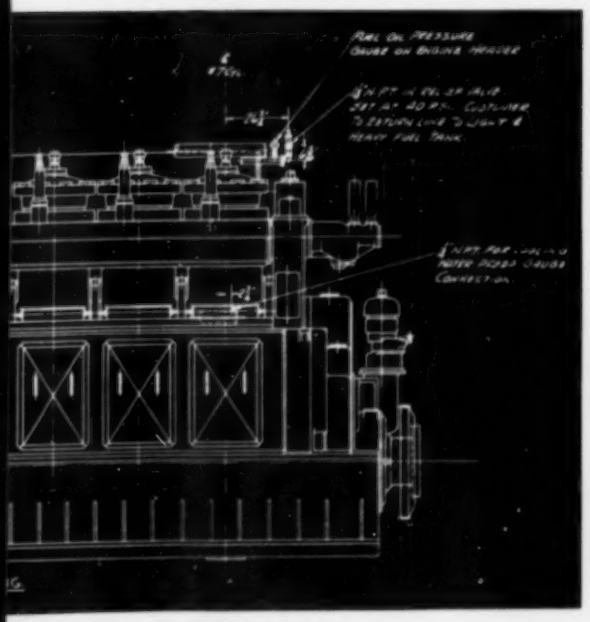


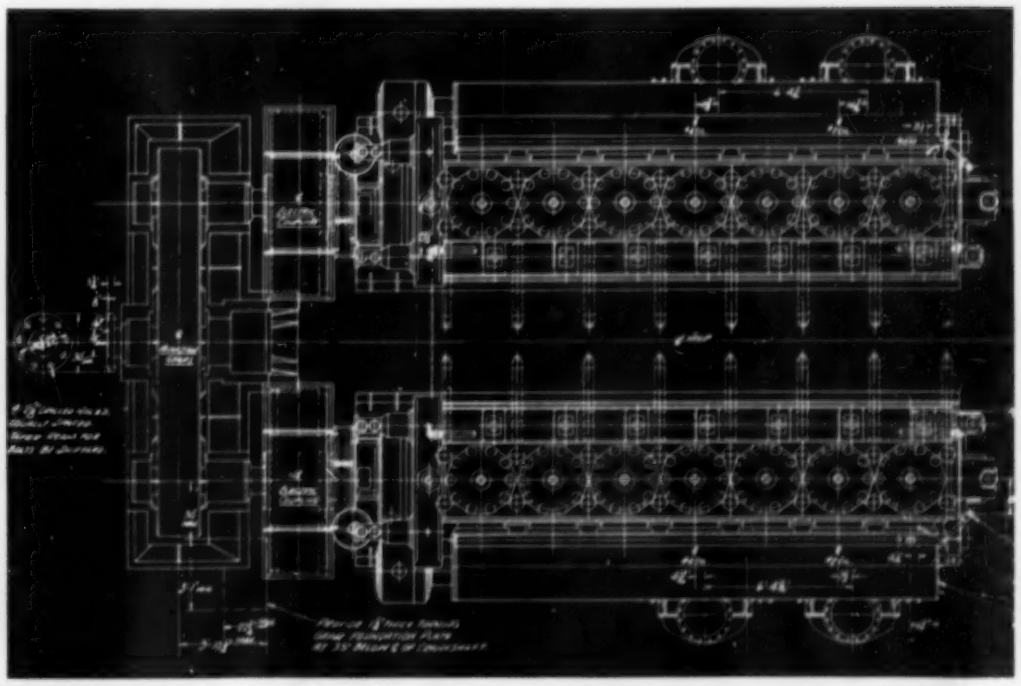
With a new bow the Motorship *Thomas Nelson* has the trim lines of a modern ship and none of the "Ugly duckling" appearance remains. Her 6000 shp is generated with a pair of Baldwin-Lima-Hamilton diesels driving thru Westinghouse gears and couplings.

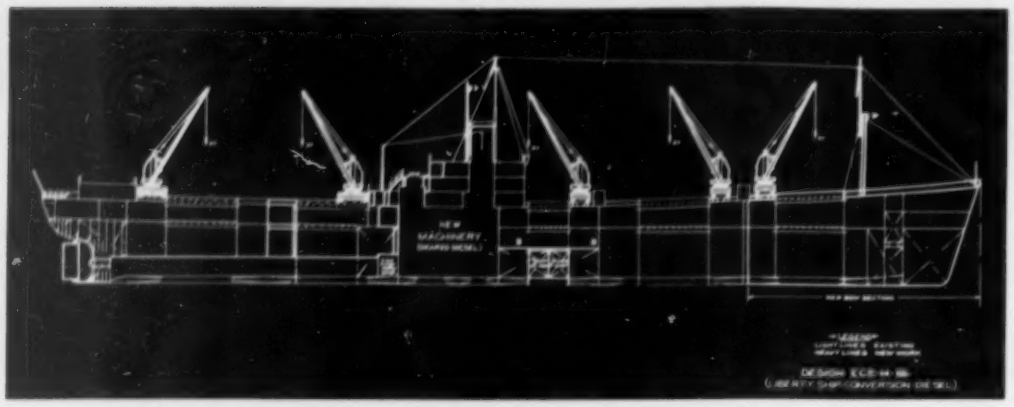


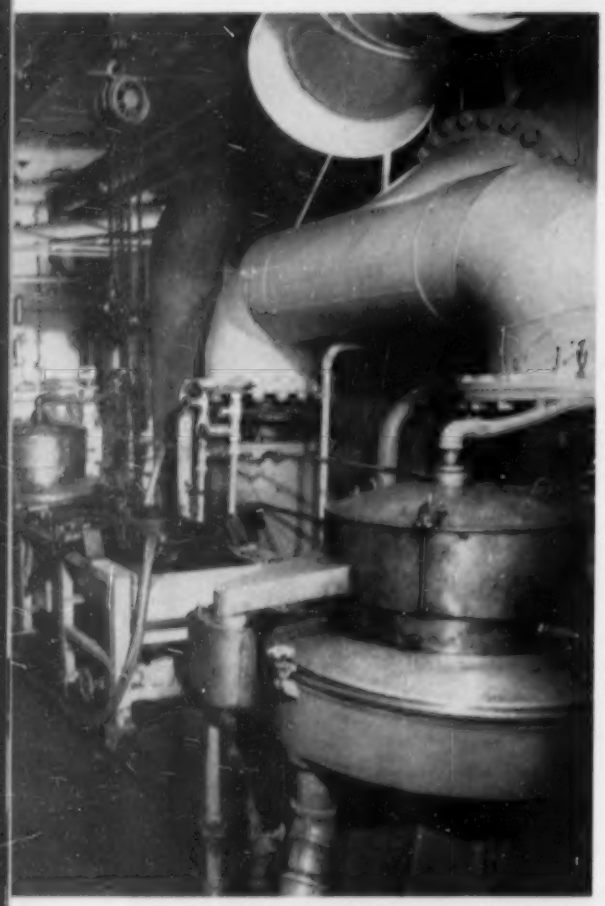


The operating side of one of the big Baldwin-Lima-Hamilton diesels installed on the M/V *Thomas Nelson*.







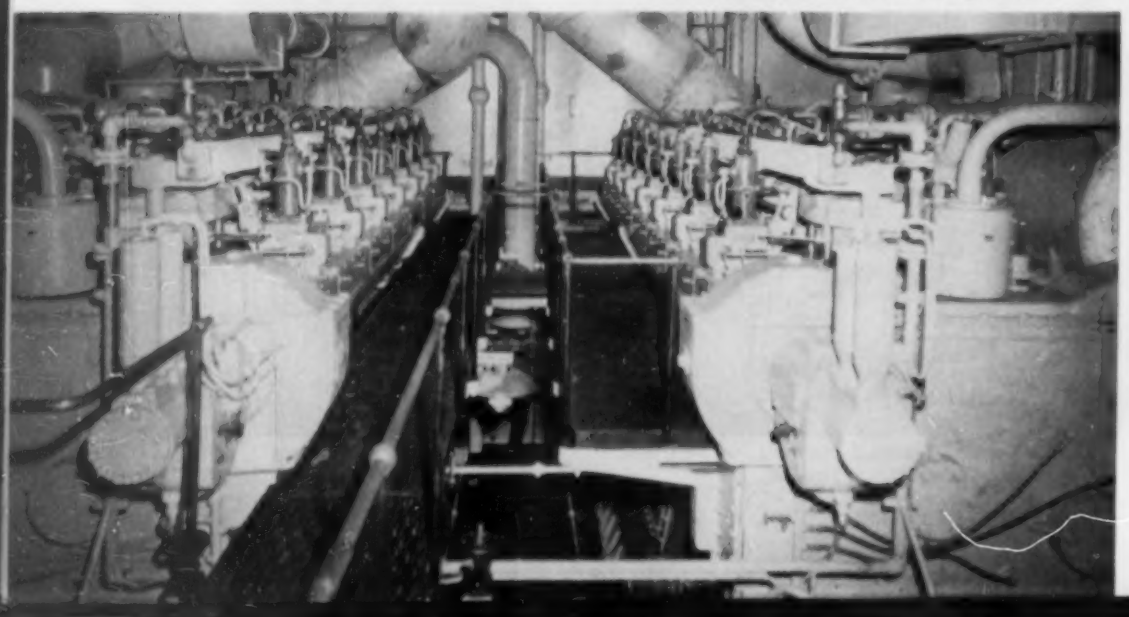


Two Sharples self-cleaning residual fuel oil purifiers. Known as Recycle Nozljectors, these high capacity centrifuges remove water, carboids, and sludge from the oil. They operate singly, one being kept for standby service.

sign of this make of waste heat boiler is ability to run wet or dry, to carry a fixed water level or operate as a flash boiler. In short, it can not be damaged by any kind of operational procedure. It furnishes steam at sea for heating the ship, for the galley and to heat the fuel oil in connection with its use in the engines. When the main engines are not running steam is supplied by a Powermaster horizontal oil burning donkey boiler supplied by Orr & Sembower. Steam is not used to provide power for any service.

The auxiliary diesels are a pair of 6-cylinder General Motors units directly connected to two 300 kw Westinghouse 120/240 volt dc generators. The main switchboards and the various power panels including those for the electro-magnetic couplings on the main engines are all Westinghouse. The generating sets are conventional. Each G-M diesel is self contained and fully equipped as an independent power unit. They are fitted with individual Harrison heat exchangers for the cooling system. Each auxiliary engine is electrically started and for this purpose a special set of Nickle Cadmium Alkaline batteries are installed in duplicate for each engine's 24 volt starting system. A special properly ventilated battery room is built in to house them, starboard in the lower engineroom. All told the generating capacity is 600 kw equally divided which is somewhat at contrast to earlier practices of graduated ratings for different sets.

Upper engineroom looking forward, shows tops of the two Baldwin-Lima-Hamilton propulsion engines with individual American Bosch fuel injection pumps for each cylinder. The exhaust pipes lead into a single Foster-Wheeler waste heat steam generator.



The system of burning heavy fuel is in conformity to fairly well standardized practice. The residual fuel is cut in after the ship is en route. It is heated, then centrifuged, dropped into a storage tank for daily service and circulated into the fuel pumps at high enough temperature to remain perfectly fluid. Proper and thorough cleaning and heating are the procedures. For the processing, there are two Sharples black oil purifiers and one clarifier. They are called Nozljectors, and are self cleansing. The general procedure is as important as it is interesting. By use of steam, a temperature of at least 180° F ranging upward to 200° F is employed to make the fuel more fluid and to reduce the viscosity of the heavy fractions.

Fuel oil is first passed through the purifiers to remove the water and the heavier solids and in this way it is conditioned for the clarifier. The overall process is to remove water, carboids and deglomerate the fuel. The procedure entails recycling a continuous stream through two recycle tanks one above the other with the upper tank free to drain into the lower tank. The ejected solids are recycled back into the centrifuge bowl but not into the main stream passing into the bowl and in this way solids are built up until the total residue in the stream reaches 50% BS & W, whereupon the upper tank shuts off automatically from the lower tank and receives the nozzle discharge while the lower tank is being completely dumped. The system is flushed with fresh oil at each dumping and this prevents a build up of solids. The processed fuel is passed through Fulflow filters, located between the day tank and the engine and then goes into the engine fuel system. It is maintained at high enough temperature to maintain a viscosity of 80 SSU, as it enters the fuel injection pumps from headers on the engines through which the fuel circulates constantly to keep it hot and fluid. Once properly processed residual fuel burns well but maneuvering on it is not attempted because not enough fuel is used at light loads, which prevents the necessary proper circulation.

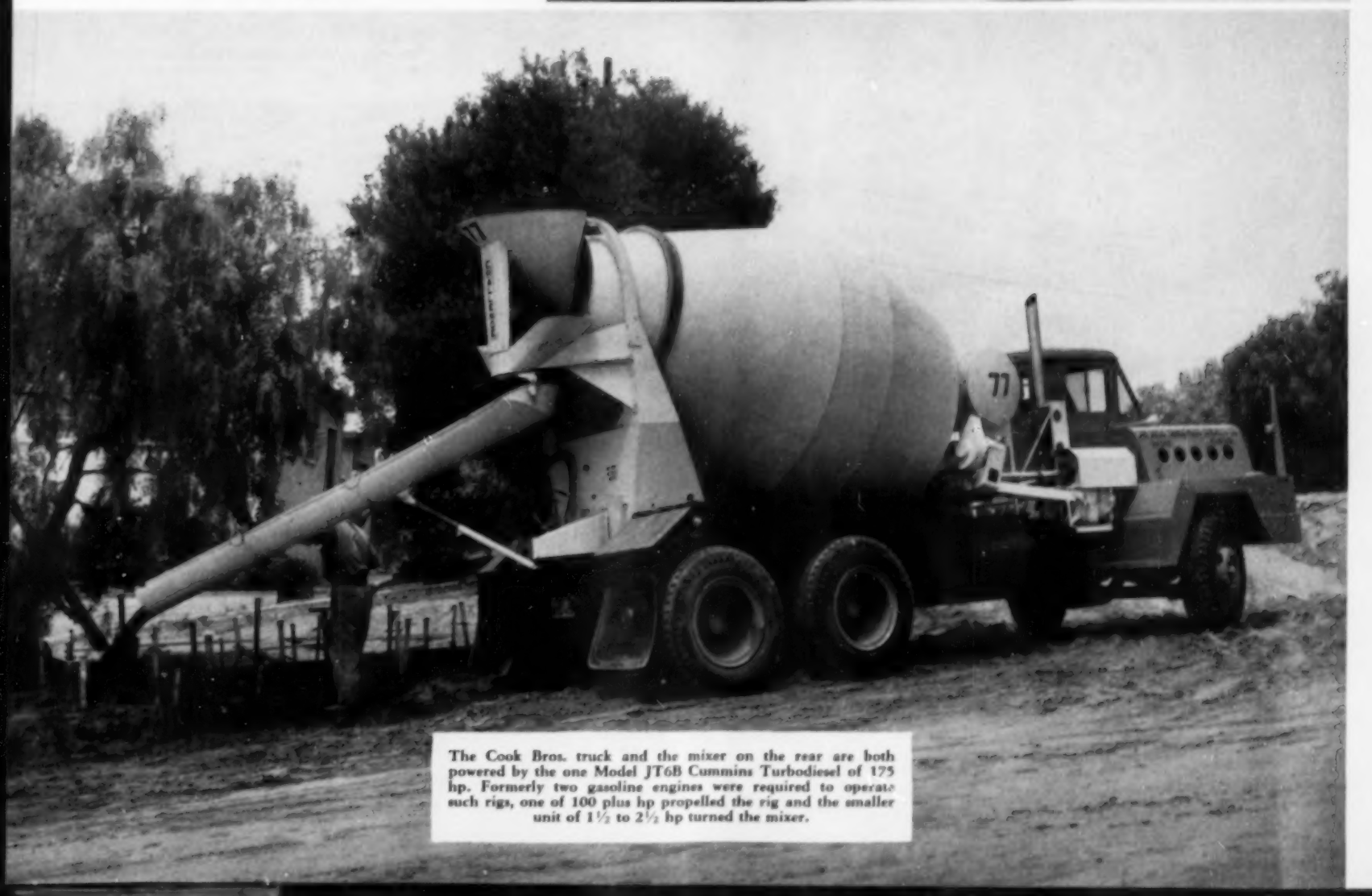
In process of conversion, the *Thomas Nelson* was fully equipped with new cargo handling cranes and deck machinery. Victory ship type steering gear built by Struthers Wells replaced the old steam steering gear. Two Liberty Ship type electric capstans and the electric anchor windlass were made by American Hoist. In navigational equipment the only addition was a Raytheon radar. Cargo handling equipment and hatches have been extensively changed. The new hatch covers made by McGregor Cameron are folding type. The ones on the hatches forward split lengthwise and fold out to the sides. The after hatch covers fold back and lay flat on deck at the after end of each hatch. Two different kinds of cargo cranes are to be tried out. The ones at holds Nos 1, 2 and 3, forward are equipped with electric-hydraulic cranes that move athwartship on tracks. The lifting capacity is 5 tons and each crane is a totally self contained unit with its own hydraulic equipment built in. The cranes on the after deck serving hatches Nos 4 and 5 are all electric. They are mounted on tracks running fore and aft and their capacity is also 5 tons each. There are no heavy-lift derricks on the *Thomas Nelson*.

DIESELS IN LIGHT AGGREGATES EQUIPMENT

By KENNETH R. MAC DONALD

TRADITIONALLY, diesel engines have performed a major and herculean role in the nation's aggregates industry, providing the backbone power in pits and quarries, running shovels and draglines, quarry trucks and bulldozers, and frequently industrial locomotives and rock crushers. Today the diesel still is performing its traditional task, but in addition diesels are now invading in full force some of the lighter applications once considered the exclusive province of the gasoline engine. The demands imposed by modern times—the need to accomplish more work, faster, and at less cost per operating unit—led the manufacturers of trucks and equipment used in the ag-

This International Harvester Truck is one of 10 belonging to Graham Bros. Inc., El Monte, Calif., all of them powered by Model JN6SB Cummins diesels of 125 hp. These units were among the first in the Los Angeles Basin in which the truck engine also was rigged with a power take off to turn the cement mixer in the transit work.



The Cook Bros. truck and the mixer on the rear are both powered by the one Model JT6B Cummins Turbodiesel of 175 hp. Formerly two gasoline engines were required to operate such rigs, one of 100 plus hp propelled the rig and the smaller unit of 1½ to 2½ hp turned the mixer.

gregates industry to design lighter but powerful trucks which could be economically used for a variety of purposes.

This trend toward the use of the diesel has been specially evident in the booming aggregates industry of Southern California. During the last 6 years, California has absorbed enough new residents to populate two cities the size of Philadelphia and Indianapolis. Providing homes, streets, highways, bridges, airports, etc., for this increased population, has placed an unprecedented demand on the industry for sand, gravel, rock, cement, ready-mixed concrete and other building materials. One of the major problems which arose to plague the producers of such materials, particularly those located in the congested industrial areas, has been traffic—the delivery of their products economically through extremely heavy traffic. One solution being adopted by an ever increasing number of rock and sand companies, has been the dieselization of medium duty aggregate trucks and of transit mixed concrete trucks.

Diesels have been used exclusively in the West to power heavy duty trucks which haul sacked and bulk concrete, rock and other materials for long distance trips. The short haul jobs, however, have been handled by the gasoline powered trucks. Industries which have experimented in a switch-over, have found that the use of diesel engines makes it possible to maintain higher average speeds without increasing the maximum speed of the trucks. Diesel engines also have sufficient reserve power so that they can be started out quickly when leaving stop streets, traffic lights and while moving ahead in halting traffic. The diesel trucks, these industries have also found, have less trouble negotiating hills. Thus they are able to get in more round trips each day than the gasoline powered rigs and they do so at a lower fuel cost. Furthermore, operators have discovered that diesel engines are available to them for approximately 25 per cent greater periods of work time than are the gasoline rigs. This, of course, is due to the frequent failures in the ignition systems of the gasoline rigs, thus taking the truck out of work more often for repairs.

Industry in California has shown a high degree of interest in the greater average road speeds possible with diesels. This interest has been based, essentially, on 3 primary reasons. First, some operators have been able to reduce their equipment needs considerably because they have found they can haul an equal amount of material with fewer units, thus reducing their capital investment in new equipment. Second, they have discovered that customers definitely favor the faster, more dependable delivery service possible through use of diesel engines. Third, reduced driver overtime becomes possible, thus enabling the operators to achieve reductions in their total operating costs.

Important recent developments in diesel engine design, which have permitted the use of lighter, more compact engines with greater hp output, have helped accelerate this trend toward dieselization in lighter aggregates equipment. Turbocharging has helped considerably to bring down the horsepower to weight ratio of diesels. For example, Cummins has two turbocharged diesels that have proved very popular in these aggregates applications—the 175 hp JT6B and the 250 hp NT6B. The use of lighter metals, and simplification in important parts like fuel injection equipment have also contributed to the outstanding performance of the compact, powerful automotive diesels of today. In the words of the drivers, "these engines permit us to wind up and unwind rapidly in traffic" and they offer much greater flexibility and maneuverability.

Weight reduction in equipment has been specially significant to the ready mixed concrete companies. The big operators formerly could make a satisfactory profit with mixers that had capacities of 4½ to 5 cu yds. Today they all want 5½ to 6 cu yd mixers, but weight limitations on roads and streets make it necessary for them to have lighter equipment to haul the heavier loads. While the diesel engine normally is larger and heavier than a gasoline engine, a compensating factor has been the

This Mack, operated by Blaser Transportation Co., Victorville, Calif. illustrates all the latest developments for maximum payloads, speed and power in the aggregates transportation field. Blaser uses two of these Model B-73 Macks with Likens aggregates bodies and trailers. The power is the 250 hp Model NT6B Cummins Turbodiesel.

point that power take-offs on the truck engines are being utilized more and more to turn the cement mixer placed on the rear of the truck. Formerly a small second gasoline engine was used on the rig, to run the mixer. This has now been eliminated. Operators now are increasingly interested in diesels that both propel and turn the mixer.

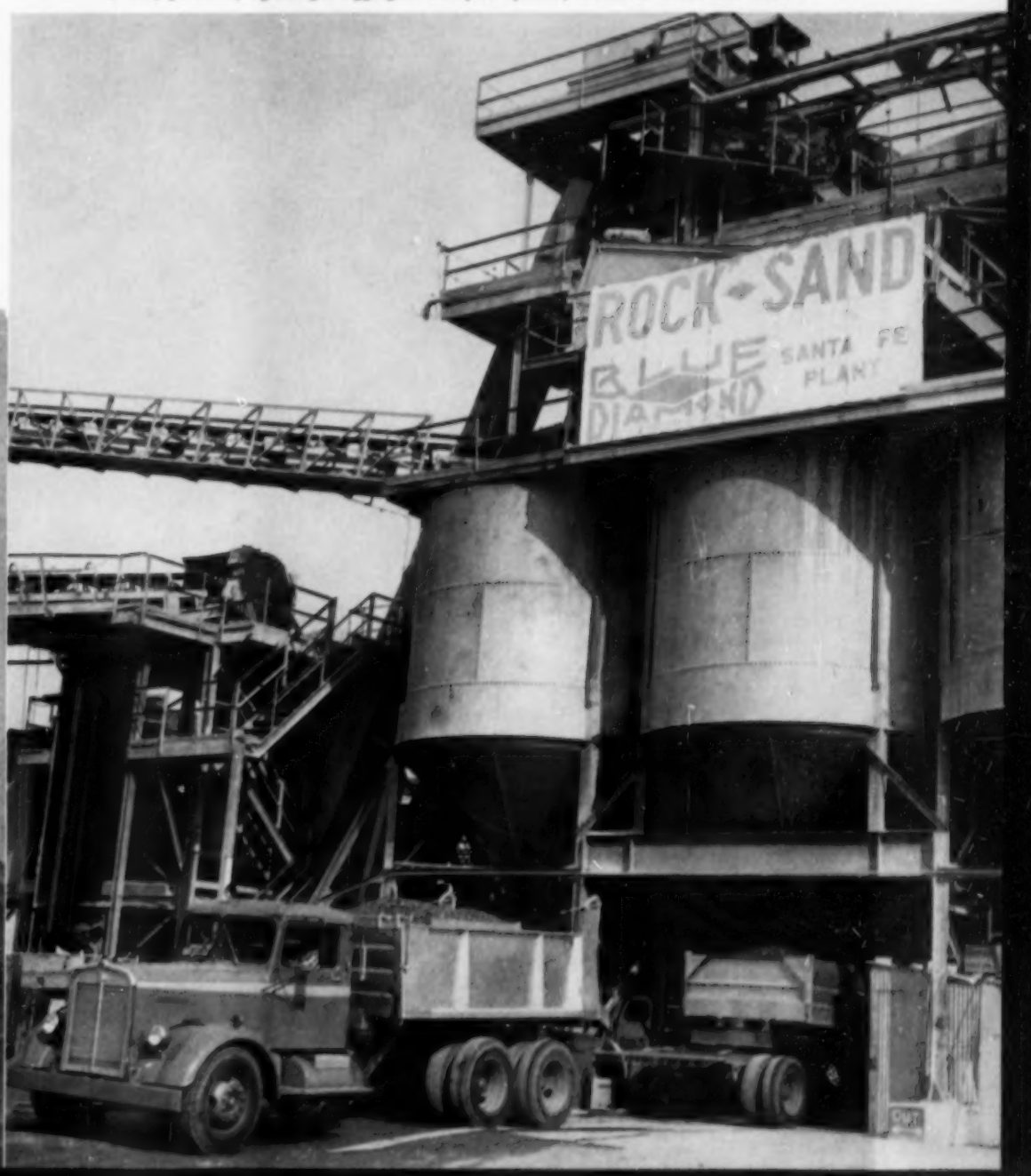
An unusual geographic feature of the Los Angeles Basin contributes to the increasing popularity of the new diesel application throughout Southern California. The rock and gravel deposits of the area are in the foothills of the San Gabriel Mountains near the suburban towns of Arcadia, El Monte, Monrovia and Azusa. Most of the demand for aggregates, however, arises in the harbor cities of Long Beach, San Pedro, and Wilmington. The average haul from the producing to the consuming area is 40 miles from the gravel pit to the ready mix and hot asphalt plants along the beach. All of these 40 miles are through highly congested areas where light weight and rapidly moving transport rigs are essential.

To actually demonstrate what could be done in the use of high powered, light weight dieselized aggregate transport equipment, a number of dealers and manufacturers in the Los Angeles area recently combined to build a rig specially for such service. The J. T. Jenkins Co., Kenworth truck dealer in Los Angeles, cooperated and took the lead in completing the project. The 175 hp Cummins model JT6B turbodiesel was used with a Fuller model 5C65 direct-in-fifth transmission and Brown-Lipe model 6231A auxiliary. The rig has a model R-200 Timken double reduction rear axle with a Kenworth third axle attachment. The gear ratio is 6 x 38:1 and provides 53 mph at 2500 rpm in fifth over.

Before the rig was sold, it was demonstrated to a number of rock producing firms in the area. Careful time and fuel consumption checks were made on the equipment. Hauling 27.2 tons of pay load, the Kenworth consistently shaved 20 per cent off the round trip times of gasoline trucks pulling smaller loads. Hauling loads of this weight under city traffic conditions, the fuel consumption average, of around six miles per gallon, was considered spectacular. Bare weight of the unit is 23,260 lbs which, with a legal limit of 77,600 allowed the truck and trailer to haul a combined payload of 27.2 tons,—13.8 on the truck, and 13.4 on the trailer. Aluminum was used in the construction of the cab, frame and cross members of the truck and the ABC Body Co. also used aluminum in the construction of the dump body, frame and bed. A weight saving of 270 lbs per axle was achieved by the use of Firestone tubeless tires, size 11 x 22.5, with Firestone high tensile steel high center rims.

Two applications of diesel engines which established this type of power in pits and quarries. Both the Lima shovel and the Euclid dump truck are powered by Cummins diesels. Work is being done in the pit of the Azusa Rock & Sand Co. at Azusa, California.

This is the Kenworth, powered by a Model JT6B Cummins Turbodiesel of 175 hp on which a number of Southern California manufacturers and dealers combined to produce a fast, powerful, lightweight aggregate transport specially suited to traffic conditions.



A large number of aggregates producers operate Cook Bros. equipment of this type. The Owl Rock Products Co. at Monrovia, Cal. uses 10 of these full cab transport trucks in their Monrovia operation and several others in their subsidiary, the Service Rock Co. at Riverside, Cal.

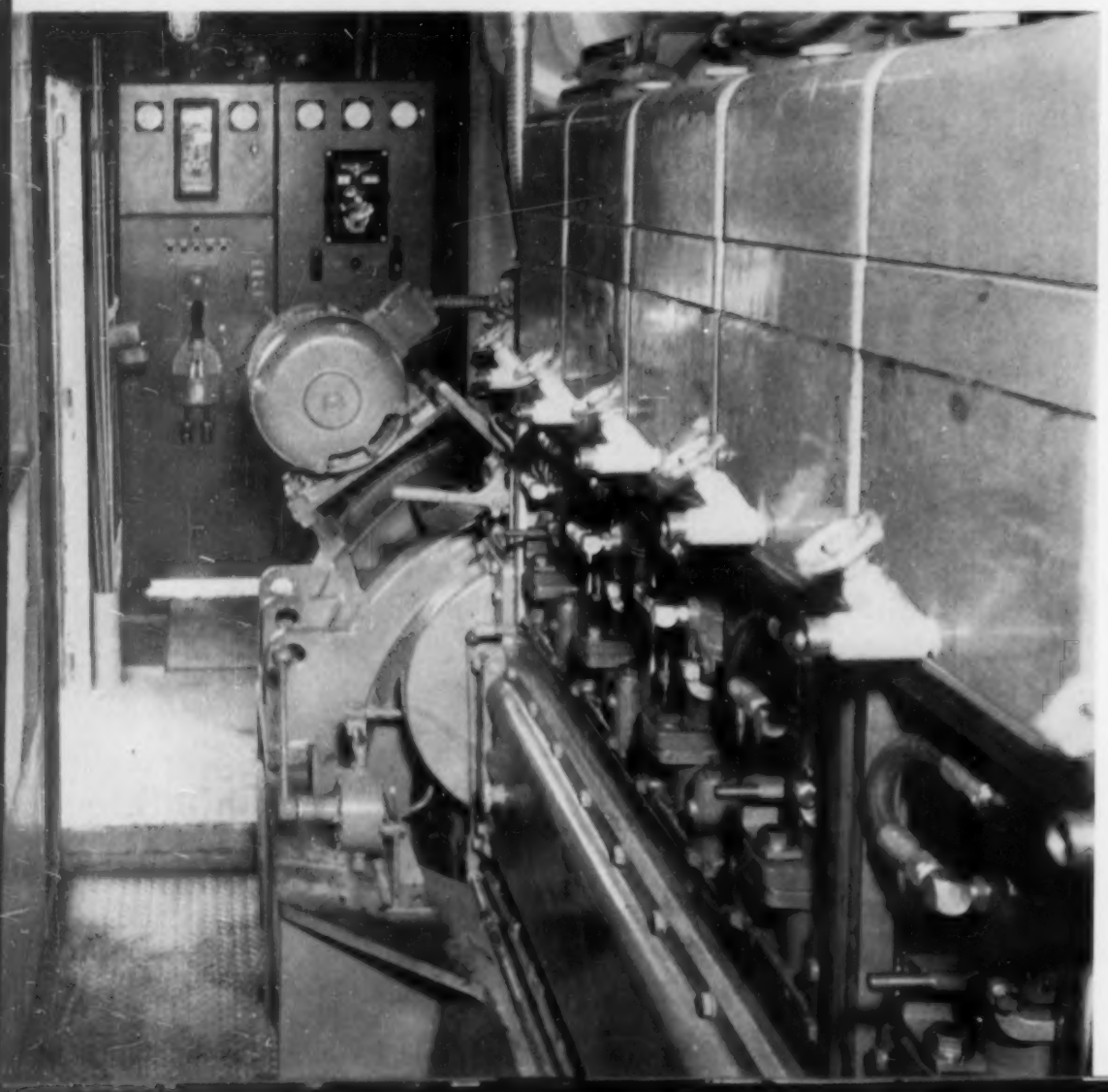
MOBILE GENERATORS GO TO VENEZUELA

TWO mobile generators permanently housed in tractor-trailer units have left on a precedent-setting trip for South America. The 500 kw generators, capable of furnishing the normal power needs of a town of 2,500 people when combined, are the first purchased for use in Venezuela. They were engineered and produced by the White diesel engine division of the White Motor Company. Both sets will be used by the Corporacion Venezolana De Fomento (Venezuela Development Corporation) as replacement power for areas where power lines and systems are being re-routed and expanded. Purchase of the units, each weighing more than 25 tons, is in keeping with Venezuela's lofty position among importers of this country's goods. With slightly more than eight million people and a strong economy, Venezuela is the United States' second-ranking customer in Latin America. Some $556 million—60 per cent of Venezuela's imports—came from the U. S. last year.

The generators represent the last word in highly-maneuverable, trouble-shooting electric power units. They are built into trailers 32 ft long, eight ft wide and 12½ ft high and are hauled wherever needed by White truck tractors. The heart of each set is a 712 hp Superior diesel engine operating at 900 rpm. Diesel fuel carried in a 280-gallon tank on the trailer's belly powers the engine. One tank will drive each unit at capacity for 12 hours.

The units were designed with an eye to economy. All essential parts are standard production items and as such, can be mass-produced. The tractor, for example, is a White 3000 series unit. The engine is an eight-cylinder model 40 Superior diesel now being used as power for industrial plants and telephone companies, and in large power shovel equipment throughout the nation. The model 40 Superiors recently were improved by White Diesel. Their simplicity of construction insures dependable operation. Overall capacity of this engine type was increased nearly 50 per cent to 1025 hp, yet the engine size remains the same.

A spokesman for the Venezuelan firm said the generators will be used to provide additional power in areas where demands have expanded beyond the capacity of transmission lines. These units will serve as the sole power source as new lines replace old in the vast expansion program directed by Corporacion Venezolana De Fomento. The booming Venezuelan economy demands mobile power. The units can be used as reserve power for hospitals, telephone companies and similar organizations, for peak load requirements, and to replace any possible losses resulting from failure of transmission equipment. General Manager William Burrows of White Diesel Engine Division said the units are the result of several years of research on mobile power plants and "were designed in cooperation with officials of the Venezuelan firm. We consider this shipment a harbinger and a start. Many Latin American nations are rapidly expanding their industry. The result is a need for more electric power as fast as possible, and that includes mobile power".



Heart of the mobile generator units going to Corporacion Venezolana De Fomento is a 712 hp Superior diesel engine (right) operating at 900 rpm. One man can operate the 500 kw set at the electrical control panel. Ideal generators on both units.

Venezuela's first two mobile generator sets, made by White Diesel Engine Division of the White Motor Company, can furnish the normal power needs of a town of 2,500. General Manager William F. Burrows of White Diesel is pictured with the driver before the first unit left for New York and shipment to Caracas.

One man can operate each of the 500 kw mobile generator units by means of a single electrical control panel. The sets will be used by Corporacion Venezolana De Fomento as replacement power in areas where power lines and systems are being expanded. Note Quincy compressor in foreground.

Both of the generator units are completely self-sufficient once their diesel fuel tanks are filled. One man can operate each complex unit by means of a single electrical distribution control panel. After a unit is located at a site requiring power, the tractor is removed and the trailer is left standing on the front landing gears and two rear jacks. The latter take the weight off the rear wheels, to preclude any motion. Lines from the generator are hooked to the transformer on the power lines or at a substation and the units are ready for action in a matter of minutes. The entire output of the generator is regulated by the control panel.

The generators are 3-phase, 60-cycle Ideal Electric Company units developing 2400 volts current. The Fruehauf trailers were especially strengthened in the chassis and sides to minimize vibration during operation. Spacious walkways on all sides of the Superior engine allow easy inspection. Louvers on both sides of the trailer assure adequate ventilation for the operator and doors on either side make entrance to the trailers easy.

HERCULES SIRES A TROJAN

Of Single Basic Design, a New Line of Engines Produced as Diesels Or Gasoline Motors With Interchangeable Parts.

By ARNOLD B. NEWELL

CANTON, OHIO. In this city of industry it was my privilege and pleasure to witness the start of manufacturing and the testing being carried out on a new series of diesel engines undoubtedly destined to create for themselves very important places in the fields of industrial, marine, mobile and portable power. My guide was the genial Chief Engineer of the Hercules Motor Company, Dr. E. A. V. Horiak, who is justifiably proud of this new concept of engine design. A family of 18 models in three, four and six-cylinder construction makes up the new series.

It is hardly necessary to introduce Hercules to our readers nor mention their pioneering in the field of light-weight, high-speed, heavy-duty diesels and gasoline motors. The company and the engines are very well known. It is, however, significant in this instance to note that this company brought to the trade a compression ignition engine that could be installed in the place of its gasoline counterpart and now with this new series they have gone much further by producing basic engines with interchangeable parts to operate on the gasoline or the diesel principle or to burn LP gas.

Pilot models were constructed and subjected to grueling tests to establish their quality, stamina, versatility and economy, and having passed these tests, more than a million dollars was spent on tooling for new series. They now are in production and delivered to manufacturers and dealers. For the benefit of the people who have witnessed the inevitable failure of attempts to burn diesel fuel in gasoline motors, I should like to make it very clear that in this group the 9 DD models are of conventional diesel design and the GO models are an equally conventional gasoline motor. In all instances the stroke is 4½ in. and there are three standard dimensions of bore, namely 3½ in., 3¾ in., and 4 in. Initially they were offered as 4 and 6-cylinder models making six of diesel and six of gasoline engine construction all having interchangeable components. The planning included a 3-cylinder engine with many components interchangeable with the larger engines and bringing the total up to 18 models, nine of which are diesel and nine gasoline or LP gas engines.

When I said the engines are of conventional design, I referred to the block form of single casting, carrying crankshaft and pistons, the one piece cylinder head, the overhead valves and rocker arms with the usual pushrods operated by the camshaft mounted in the block, plus the oil pan underneath and enclosures over the valve-operating mechanism. These features are revealed clearly in the accompanying line cuts. A departure from earlier Hercules design is direct injection of the fuel, thus dispensing with the spherical combustion chamber so familiar to users of Hercules diesels.

If one of these engines were purchased as a gasoline motor and it were decided to convert it to a diesel, new longer pistons would be installed to give the higher compression, a new cylinder head casting would be needed, but valves and guides would remain the same; the spark plugs and distributor would be replaced by a single plunger fuel pump and injection nozzles but the same timing gear that drove the distributor would drive the fuel pump; a mechanical governor built integral with the fuel pump would be used instead of the governor built into the camshaft gears for the gasoline motor, the manifold and carburetor on the gasoline motor would be replaced by an air intake and exhaust manifold on the diesel. That's it. We illustrate the engine in both forms.

The engine is permitted to operate at 2000 rpm as a diesel. It revs up to 3200 rpm as a gasoline motor. If customers require higher speed diesel engines, Hercules offers a turbulence chamber engine better suited to faster running. The accompanying charts show the power and torque curves for the engine in both forms. It will be noted that the 6-cylinder 4 in. bore in gasoline motor form at 3200 rpm delivers just over 130 hp while the same engine as a diesel at 2000 rpm shows 100 hp on test. Commercial ratings would not be the same as the test ratings of the bare engines. These charts reveal that diesel version power output is about the same as that of the gasoline motor at the same speed.

In one respect these engines have the most extraordinary versatility of any engine gasoline or diesel ever to come to your correspondent's attention. The crankshaft, cylinder and oil pan can be turned end for end which in effect means that a unit can be assembled for right or a left hand installation and clockwise or counterclockwise rotation. The manifold can be on either side for convenience of installation or the flywheel can be put on either end. In marine service any two engines can be assembled for outboard rotation. Nothing but the standard parts are needed for these changes which can be made in any one of the engines. This combined with convertability from gasoline to diesel operation with not too many parts changes bespeaks utilitarian qualities that are surprising to say the least. S.A.E. standards are of course employed for engine mounting of reverse gear or generator on flywheel housing.

It is at once apparent that some elements of the engine are in excess of gasoline motor requirements as for example the helical gear in the middle of the camshaft that drives the distributor on the gasoline motor, or the fuel pump on the diesel is heavier than usual. Added costs for such items are compensated for by standardization of manufacturing operations.

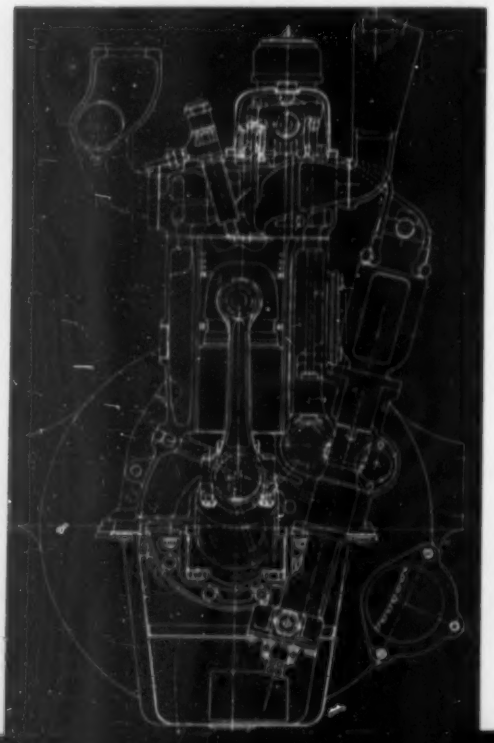
Characteristic design features are of interest. The amply proportioned crankshaft with induction hardened surface has a bearing on each side of each crank so that each engine has one more precision main bearing than it has cylinders. Drop forged con rods of conventional design are fitted with full floating piston pins. Aluminum alloy anotined pistons with liberal ratio of length to diameter are designed for heavy duty service. They carry two compression rings and two lube oil control rings in the gasoline engine and the diesel with longer pistons has three compression rings and two lube oil control rings.

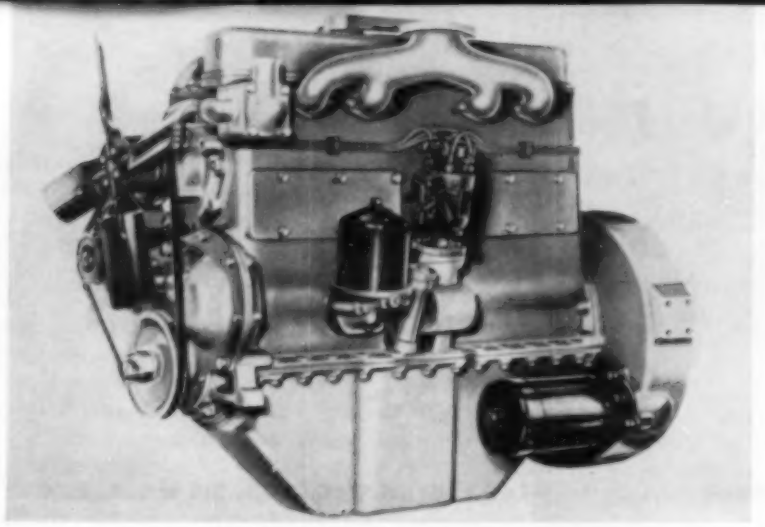
Precision type dry liners or cylinder sleeves can be inserted with a push fit in the 3½ and 3¾ in. bore engines, thus making replacements easy to do. However the 4 in. bore models have cylinder blocks of suitable alloy for long wear and are not fitted with sleeves as the designers believe the trend is away from replaceable liners in diesels.

Valve ports are made as large as possible in order that the same valves, springs, push rods and tappets can be used on engines with different numbers of cylinders but also interchangeably in the gasoline and diesel models. A spring loaded cluster type of seal at the flywheel end of the crankshaft permits building the engines shorter than usual with engines of the same cylinder bores.

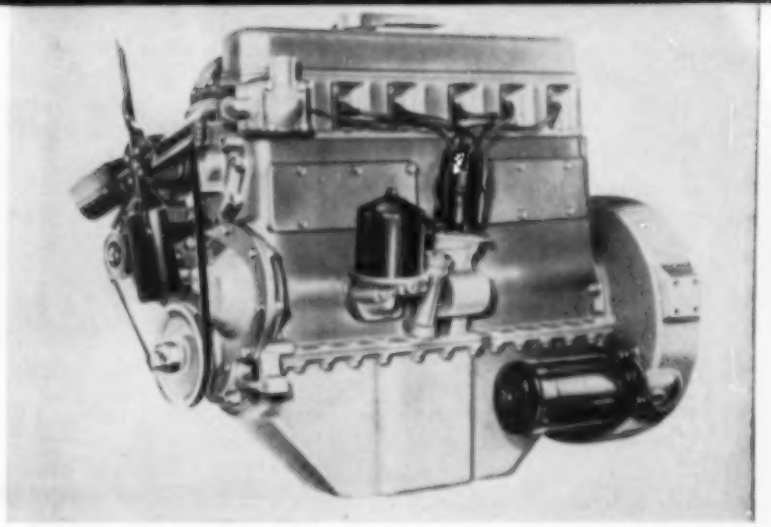
The combustion system of the diesel was worked out to secure easy starting in cold weather making it possible to use small starting motors and in many applications to use the same starting motor

Cross section reveals the design characteristics of the engine fitted out as a diesel.





The six-cylinder engine in diesel form showing the fuel pump and injection lines in the positions occupied by timer and wires on the gasoline motor.



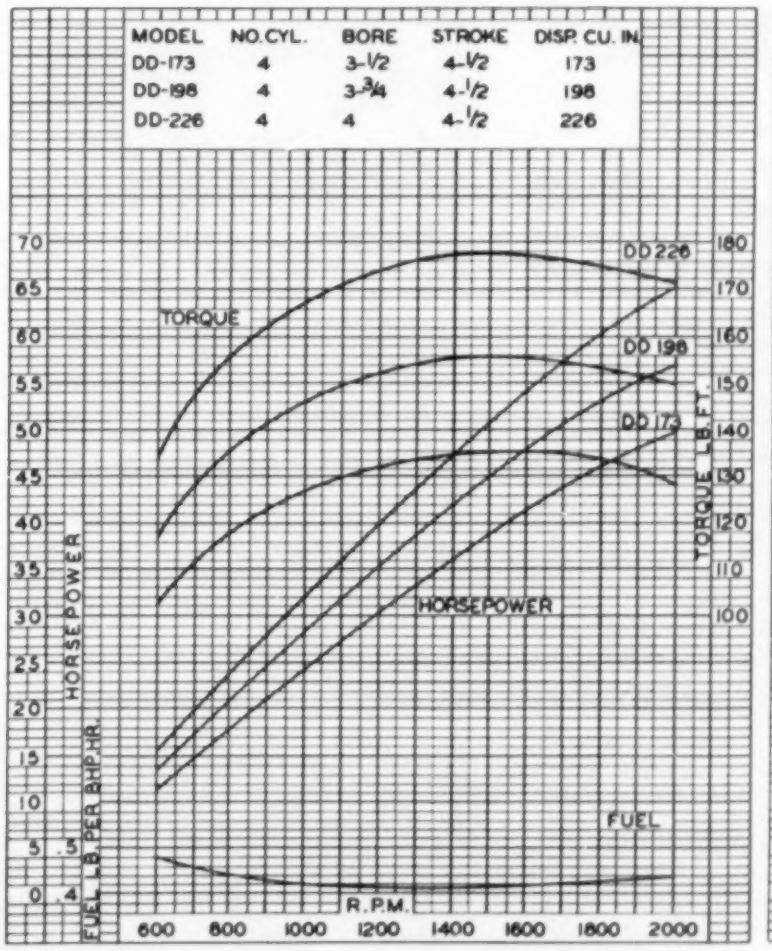
Note the identical features of the six-cylinder model in gasoline engine form as compared to the diesel.

for some sizes of both gasoline and diesel engines.

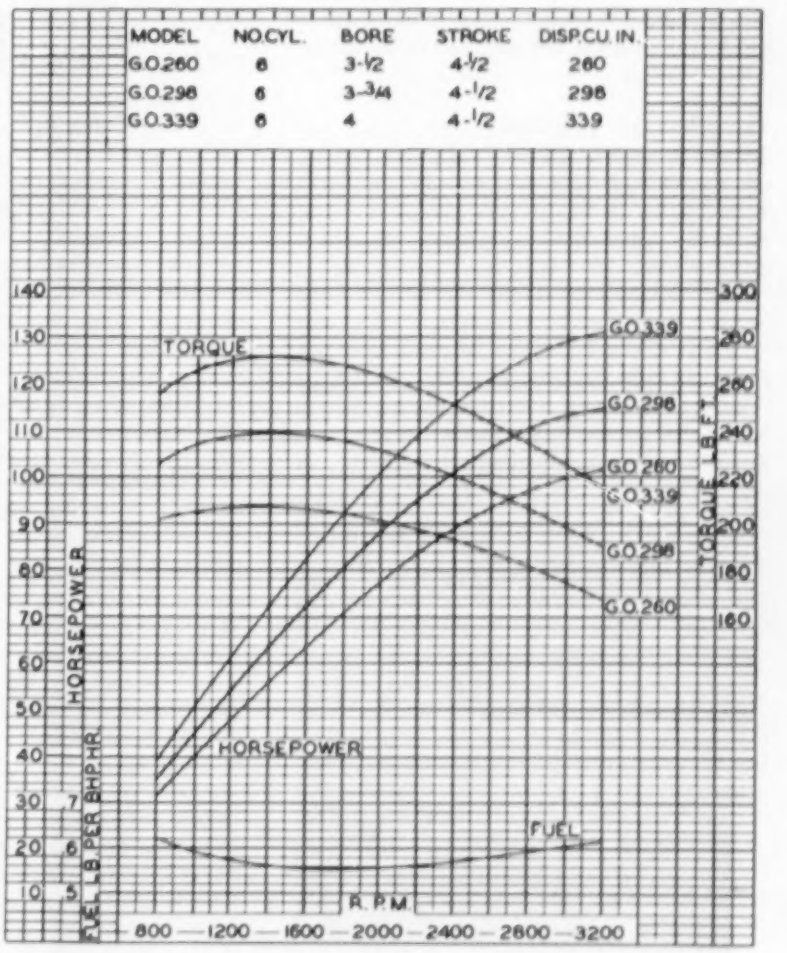
The water pump mounted on the front end of the cylinder block is combined with the fan and belt driven from the crankshaft. The pump can be mounted at either end of the cylinder block and the water inlet opening permits the pipe to point to either side regardless of which end of the block the pump is mounted on.

A separate casting to house the timing gear enables the manufacturers to offer the engine with a multitude of different front mountings at competitive low cost and at the same time permits economical manufacture with a wide variety of different gear arrangements. What must be apparent to every one reading this article is the fact that, as a gasoline motor the price must be competitive with other makes of engines. It is also apparent that the selling price as a diesel would not be much different than the price as a gasoline motor which, however, does have a higher power rating due to its higher rotative speed. In short, this appears to me to be an engine offering the inherent advantages of diesel economy on a competitive basis to gasoline engines and it is being put out by one of the very prominent gasoline engine makers.

Power and torque curves developed for the diesel models under the same conditions as the gasoline motor test delineated on the companion chart.



Curve showing performance of standard stripped engine as developed on dynamometer corrected to 29.92 in. sea level barometer and 60° F., as gasoline motor.



EASTERN DIESEL OBSERVATIONS

A COMMENTARY BY **ARNOLD B. NEWELL**

Arnold B. Newell, a third generation American, was born near Seattle, Washington of pioneer stock. He obtained his engineer's license at 21. Sailed as chief engineer on one of the first ocean-going motorships built in the U.S.A. In 1924 he joined New York Shipbuilding Company in diesel advisory capacity, tested and took to sea New York-Werkspoor diesels, supervised operation of shipyard owned vessels, then in 1927 joined Ingersoll-Rand as diesel field engineer. Became associated with "Motorship" in 1929. Subsequently became managing editor of "Motorship" and "Diesel Power," then vice-president and general manager.

Head End Power

The installation of two diesel engines with a top rating of 600 hp each in a special car furnishing power for the new Tubular Train produced by The Budd Company of Philadelphia serves to focus attention upon a condition that has been in process of development over a period of several years. Amongst some manufacturers the turn of events is most gratifying while for others it has been calamitous. Because of belt driving generators off the axles of the coaches, the burden on the locomotives became too great as trains developed greater demands for service electricity. To relieve this burden under-car units were developed with automatically operating diesels to drive generators, each of sufficient capacity to supply the coach to which it is attached and the ajacent car in the event of failure of one of the sets.

This shifted the market from one class of manufacturer to another. However, we have not seen the end of train modernization and the design trend to smaller wheels and lower center of gravity materially reduces the space available for under-car generating sets. With the introduction of electric cooking and heating the modern train demands far greater service power. To meet this demand the new Budd train carries a head end power car having alternating current amongst its numerous advantages. Thus the lighting battery is displaced by the diesel, which, however, continues using starting batteries.

Great Lake Motorshipping

To those of us who find time to read some of the marine magazines published abroad it seems evident that Europeans, and no doubt Asiatics as well have their plans well laid for services directly into Great Lakes ports as soon as the St. Lawrence Seaway is completed. They have taken into account limitations imposed by depth of water on the lakes and existing and probable future docking and loading facilities. At the same time they have made a study of the kinds of cargo moving to and from the Great Lakes region and ship design is being made to conform to trade requirements. So far as we have observed, all new designs for foreign ships to enter the Great Lakes trade are for diesel propulsion. This kind of power seems to be taken for granted and it is worth mentioning that not all ocean-going ships can navigate the Great Lakes.

Our far sighted European friends are designing their ships for alternate services in other trades during the winter freeze-up. In short they are endeavoring to be fully prepared to take advantage of all developments. This is no doubt smart business. On the other hand, we hear little or nothing of plans to build American motor vessels or steamships for that matter to operate out of Lakes ports in foreign trade. This is a pecular situation because some of the tonnage now moving in American bottoms out of seaports of the country originates in the Lakes region and if foreign bottoms pick it up in the future more of our ships will go into layup. It is a situation worth watching.

Come In Tom Sawyer

Regular reports on Gas Turbine Progress have needed to be published for some time past. It is therefore a matter of considerable pride and pleasure to welcome Tom Sawyer to these pages as a fellow columnist. The gas turbine occupies a peculiar position in the engineering end of the publishing field. Every one is interested and that is about all. What others may do or fail to do is no affair of ours. The gas turbine has a great future and it is closely allied to diesel developments. No one is better qualified than Tom Sawyer to set forth this relationship on paper. He has a rare combination of engineering and writing ability and he has been carrying the ball for the gas turbine for some time past.

Tom will tell you more about gas turbines than I will ever learn, but even to a died-in-the-wool dieselite out of the old Puget Sound realm of gas skinners the turbine-diesel connections are obvious. We now speak of turbocharging in the familiar manner of referring to commonplace items such as fuel pumps and air filters. The turbocharger embodies a gas turbine. We discuss the free piston diesel while realizing that whatever is free is not harnessed to work. In this instance exhaust gases not pistons are harnessed and used to generate turbine power. That we shall have gas turbines operating independently of the diesel engine and free of the diesel cycle is very apparent. They have the advantage of relatively trouble-free burning of cheap fuels. Now that I have Tom Sawyer as a fellow writer in these pages I shall say no more on the subject of gas turbines. His hands will handle this interesting and important subject.

The 1957 National Motor Boat Show

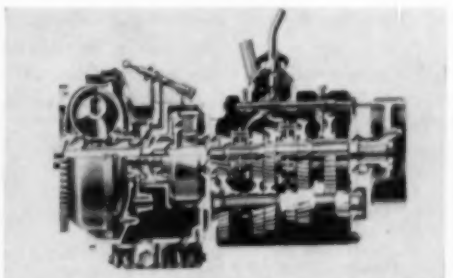
Now that the National Motor Boat Show moves to the new Coliseum in Manhattan from the Bronx, a different class of attendance may be expected. For over half a century this has been as much an engine show as a boat show, dominated from era to era with different kinds of engines. At times the show has lost favor with almost all diesel manufacturers. In recent years the most impressive displays have been made by outboard motor manufacturers. Always the most stable and consistent exhibitors have been gasoline motor makers. Despite all of these variations there is no other exposition in which so many diesels have been displayed so long and currently there is a belief that the smaller motors merely whet the appetite of yachtsmen for the larger, more dependable, safer diesels. Aside from all that, the Show is attended by people of wealth whose interest may embrace diesels for many different kinds of services and this class of attendance is likely to be more predominant in the Columbus Circle-Central Park section of New York City than was true of the more inaccessible Kingsbridge Armory. Even in the out-of-the-way location, many would-be exhibitors applied for space after it was not available and sometimes a diesel would be put in a show window across the street. The new Coliseum with its Carnegie Hall environment may be a better place for diesel exhibits to be shown.

IT'S HERE! JUST OFF THE PRESS! Bigger, better, completely revised, rewritten and brought up to date. It's Volume 21 of **DIESEL ENGINE CATALOG,** now ready for mailing. Mail orders are now being filled for this giant reference book with its all-new, profusely illustrated engine and accessory section. Be sure of your copy of this limited edition, which costs $10 postpaid plus California sales tax where applicable. Send checks or company form orders to **DIESEL PROGRESS,** Los Angeles 46, California.

Power Train Package

Compact size, simple trouble-free components, easy installation and long service life are features of the TransVerter, a new power train package developed by Clark Equipment Company's Transmission Division, it was announced by C. H. King, vice president. Rated for engine torque output of up to 325 lb/ft, the TransVerter consists of a torque converter, hydraulic disconnect clutch and standard transmission in one unit ready for mounting with any standard make engine. Because of the unit's compactness—only 8 in. longer than a conventional transmission and clutch, the TransVerter can be installed by the original equipment manufacturer without a major re-design of the line.

Designed specifically for off-highway and stop-go operations, the TransVerter is particularly suitable for various types of construction equipment. Operational advantages of the new Clark power train include elimination of engine stalling and lugging; sharp reduction in gear shifting to the point where most work can be performed in the same gear; and fine inching control by simply working the throttle. Provision is made for SAE power-take-off attachments, to be driven by the torque converter. Because a hydraulic disconnect rather than a heavy friction clutch is used, tired left foot troubles are eliminated. The hydraulic disconnect clutch is an on-off type unit that does not require letting in, or easing. As a result, any one of a variety of clutch releases can be provided, including shift lever button or even a conventional-looking pedal raised slightly from the floorboard.

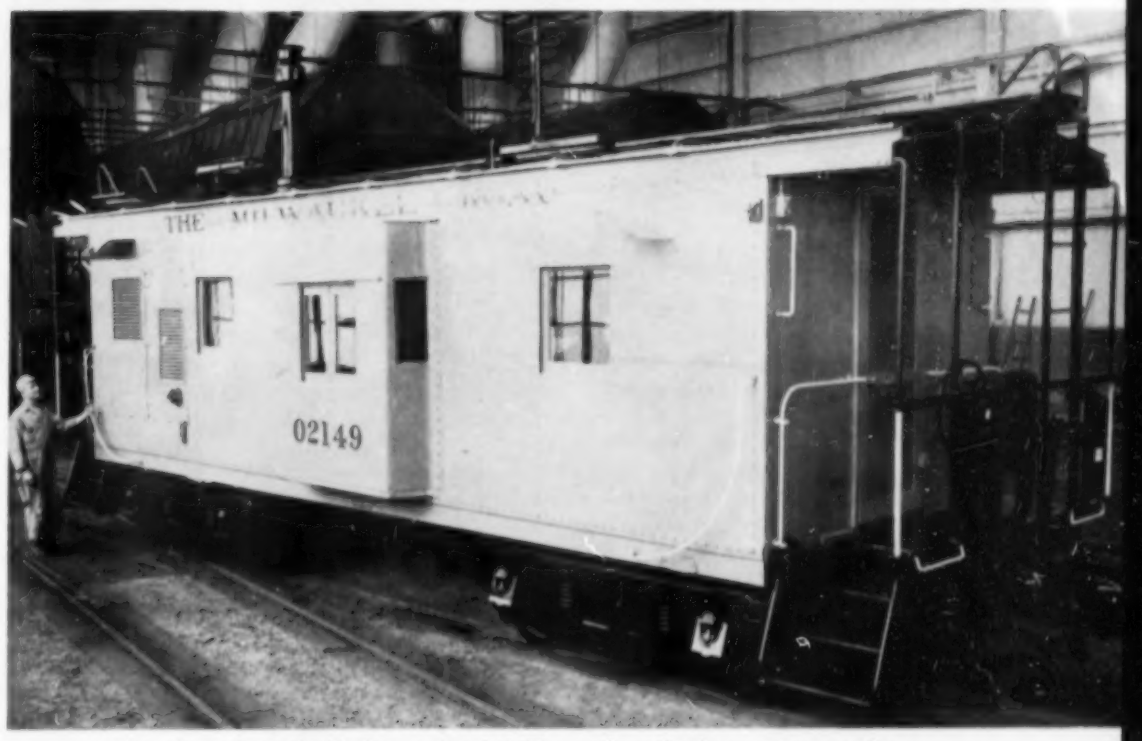


CLARK TransVerter Power Train

The Clark designed-and-built torque converter in the TransVerter is a single stage, 3-element type with a 2.57-1 maximum torque multiplication ratio. It is equipped with an over-running clutch in the stator so that the converter performs as a hydraulic coupling under light load conditions. As a result the unit can operate at high efficiency throughout the load range. Because the torque converter has a coupling gear type of drive, the TransVerter can be fitted to any engine equipped with SAE housings and a suitable flywheel.

Clark-built transmissions, coupled with the heavy-duty converter and hydraulic disconnect clutch units, are available in the TansVerter power train in the following types: 4 speeds forward—one reverse, or 4 speeds forward—4 speeds reverse; 5 speeds forward— one reverse, or 5 speeds forward—5 speeds reverse with 2nd, 3rd, 4th and 5th speeds synchronized; 5 speeds forward and one reverse in a non-synchronized version. All available with SAE No. 3 Bell housing. A variety of clutch and transmission controls, as well as transmission brakes are available as optional choices.

A DIESELIZED CABOOSE



The caboose designed with the men in mind. The small ventilated compartment at the left houses the Power Chief diesel-generator set. A 100 gal. fuel tank, located beneath the compartment, is filled from the outside. On top of the caboose (left to right) are located an engine exhaust muffler, space heater chimney and radio antenna.

COMMUNICATIONS, conveniences, comfort and safety are features of the new cabooses now being placed in service by the Milwaukee Road. Designed with the men in mind, they rate high with every freight conductor and rear brakeman. Each caboose is equipped with a high frequency radio.

The transmitter is located on one wall and the hand set is mounted on the opposite wall above a work table. The conductor, engineer and various stations along the line are all on one frequency so they can quickly communicate with each other.

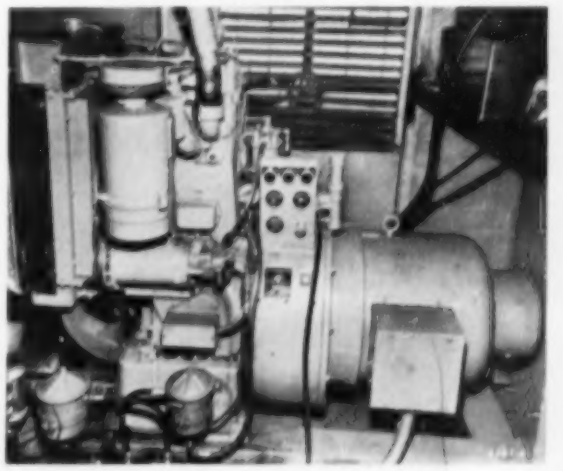
On a number of the cabooses, electric power for the radio, stove-refrigerator unit, inside lights and outside marker lights is obtained directly from a compact, self-contained Nordberg Power Chief engine-generator set. The one cylinder diesel unit is direct connected to a 5 kw generator which produces 120 volt, single phase ac current at 1200 rpm.

The engine has a complete radiator cooling system. Fresh air enters the engine compartment through a ventilator on the side of the car and is blown through a special, heavy duty radiator, designed to stand the shocks encountered in railroad service. From the radiator the air is forced outside through another ventilator by a pusher type fan on the engine. Beneath the engine is a 100 gallon fuel tank that is filled from the outside. Both the engine and space heater draw their fuel from this tank.

Power Chief engine-generator sets have served well on another caboose of The Milwaukee Road. The service history of this engine shows that during a six month period, the engine ran approximately 2000 hours and was started and stopped 175 times. During this time the caboose traveled 43,347 miles on various length runs including the 3612 mile round trip from Minneapolis to Tacoma, Washington. There are no storage batteries for reserve power and the engine is operated continuously while the crew is aboard. Operated solely by the train crews, the engine did not require maintenance of any kind.

The Power Chief generating set maintains a voltage regulation of less than plus or minus 2% and thus eliminates even the need for adjustments. The engine has an ether capsule starting system for use in cold weather and safety controls which stop the engine in the event of high water temperature or low lubricating oil pressure.

The compact, one cylinder Nordberg Power Chief diesel-generator set is installed in a corner compartment of the caboose. Special shock resistant mounting rails and a complete radiator cooling system are features of the dependable engines.



SMALL DIESEL FOR O.E.M. INSTALLATION

A German high-speed Unit With a Unique Cooling System, Using Ball and Roller Bearings and a Built Up Crankshaft, Offers Many New Features.

THERE has long been a somewhat unsatisfied demand in these United States for a compact, lightweight low-powered full diesel engine for use in O.E.M. equipment, such as portable air compressor sets; portable concrete mixing sets; portable irrigation sets; portable pumping sets; portable electric generator sets; portable diesel units with a power take-off belt or pulley, which could be attached to the equipment desired to be driven; small boat installations; portable units for driving hoists; small diesels for small tractors; small diesels for large mowing machines for golf courses; small diesels for operating conveyor belts for isolated conveying of material, and a thousand-and-one uses to which a small dependable diesel can be put.

Such an engine is now being imported into these United States by the Lynn Engineering Company, Russ Building, San Francisco 4. For the time being, Lynn Engineering Company people are only interested in the sale of this engine for O.E.M. installation. They are not yet set up, and frankly don't anticipate so doing, for the sale of this imported German unit for individual sale for separate and distinct applications. This imported engine is priced low enough to really appeal to the manufacturer of such items as are mentioned in the first paragraph. We briefly described this midget diesel on page 55 of the October issue, under the heading of "Midget Diesel Generator Set", where we described how this Farymann diesel has been adapted to driving a 2500 watt generator set, the whole unit only weighing 315 lbs. including generator, and only measuring 20 x 25 x 30. Now on these two pages, we are bringing you, our readers, a more detailed description of what we consider a very interesting design, priced quite low.

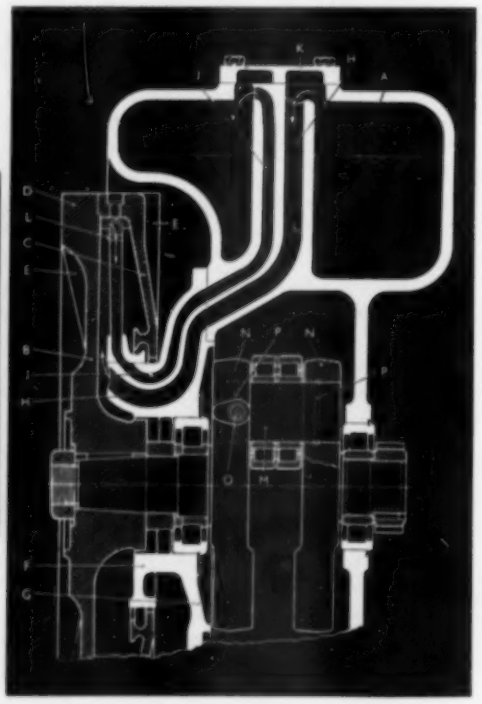
In this article, we will confine our description to the Model E Farymann. It will be noticed that this engine is rather typical of small diesels currently being manufactured in Germany, which are of the single-cylinder horizontal type, many of them hopper-cooled, because this particular type fits into mobile and transport applications.

The sales appeal of this single-cylinder, 6 hp type of engine is not so much a result of its self-contained nature, but to a large extent the outcome of a considerable design effort directed towards low weight and compact bulk. All Farymann engines are four-stroke units, and employ the anti-chamber principle, because of its low injection and peak pressures, and possibly because of its relative insensitivity to fuels of varying origin and different quality. The pear-shaped swirl-chamber is cast integral with the cylinder head and is offset relative to the cylinder axis to permit the accommodation of large valves. The injector, located parallel to the cylinder axis, directs the main proportion of the fuel spray towards the throat of the chamber, a small proportion only impinging on the chamber walls.

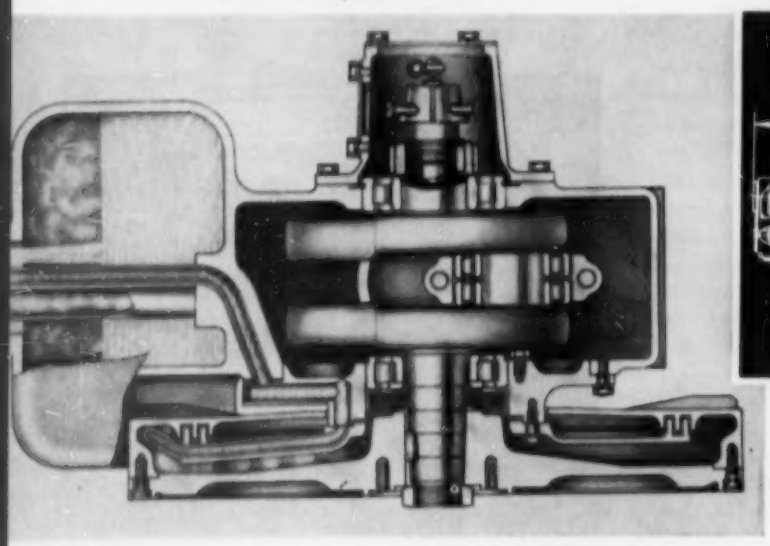
The illustrations on these two pages show both sides of the type E Farymann; the close-up of the anti-friction bearings and the built-up nature of the crankshaft; another illustration shows the Bosch injection nozzle and the plug for injecting the ignition helper. The other illustrations on these pages, are a cross-section of the engine showing the built-up crankshaft with its bearings, the efficient cooling system, which is illustrated to better advantage by the cross-section.

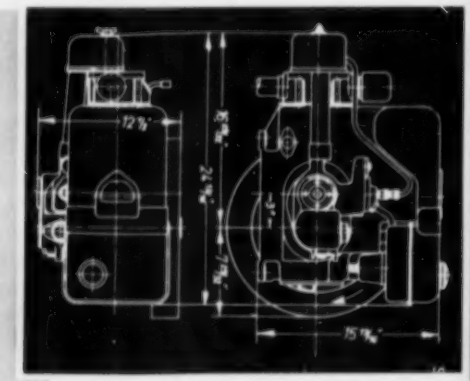
This cooling system on the Farymann diesel is unique so let us briefly describe it. This Farymann Model E diesel comes equipped with a so-called "flywheel condenser", which has been designed to overcome certain shortcomings associated with the ordinary type of hopper cooling. We ask you to look at the two illustrations of the engine, where you will see the flywheel condenser. The condensation of the vapour, emerging from the water space (A) of the hopper takes place in a hollow cylindrical space formed by the flywheel disc (B), which is keyed to the crankshaft in the usual way, and a back plate (C), which is bolted to the rim (D) of the flywheel. The flywheel disc, as well as the back plate, having radial fins (E) for the purpose of increasing the cooling area and for directing a flow of air towards the circumference. The back plate (C) covers the rear of the flywheel, apart from a circular hole, slightly bigger in diameter than the boss (F) of the crankcase cover-plate (G), which carries one of the two roller bearings wherein the crankshaft runs. The cover-plate (G) has two cored-in passages (H and J), both communicating with the water space of the hopper, which is sealed against the atmosphere by the filler cap (K). Vapour developing at the top of the hopper is forced down through the passage (H) and enters the flywheel condenser at the hub; it expands in the hollow space inside the flywheel and is condensed on the rotating walls which, owing to their high velocity relative to the sur-

Details of construction of the flywheel condenser cooling system. The lettered parts are referred to in the text, which explains the method of working. In this drawing the static parts are shown black.



Cross-section of 6 hp single-cylinder Farymann diesel showing the cooling system.



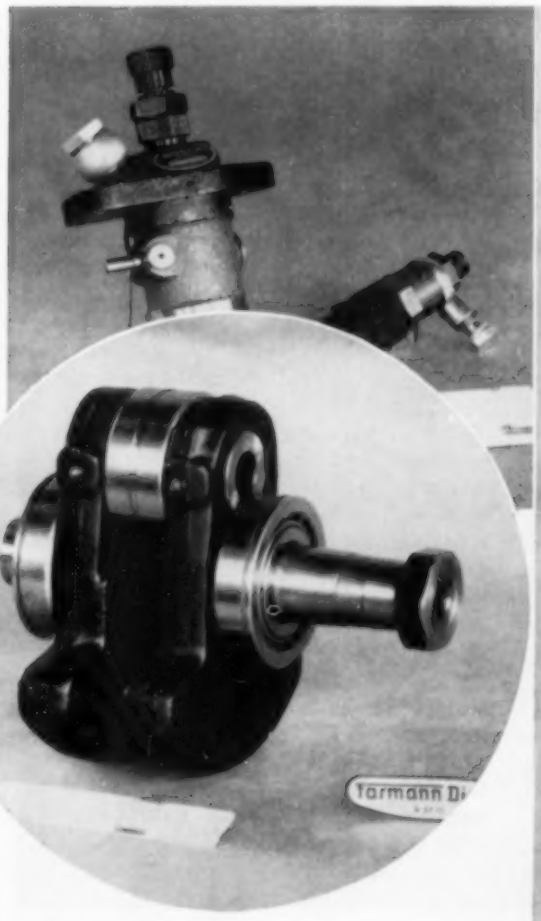


Dimensional drawing of 6 hp Farymann diesel, model type E.

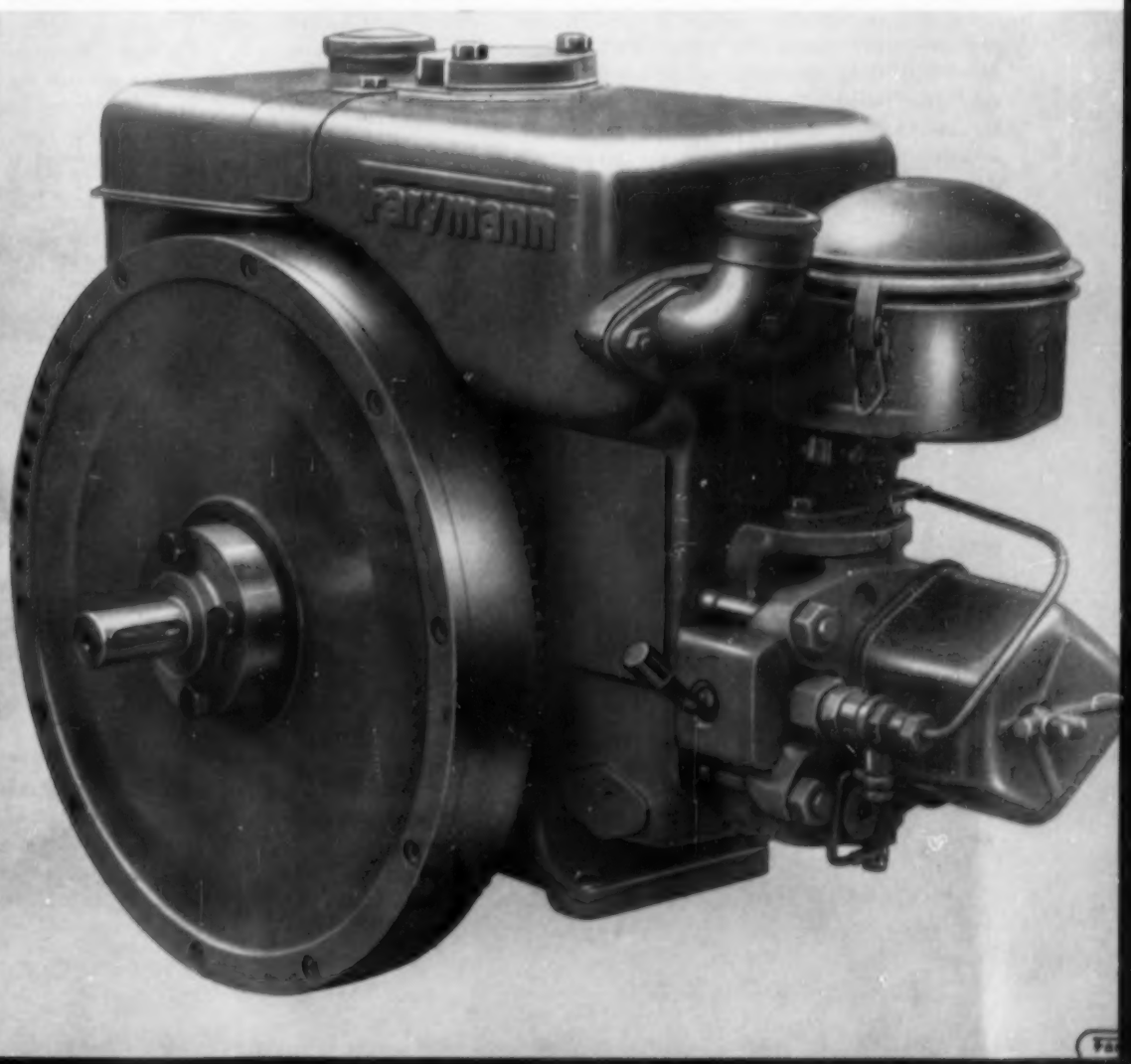
rounding air, are kept sufficiently cold. The centrifugal force causes the condensate to collect at the rim and the water forming a rotating annulus at the circumference of the condenser space, is returned via the passage (J) to the hopper by a stationary scoop (L), which is located on a projection of the boss of the cover-plate (G). No seal is provided between this boss and the circular hole of the back plate (C), as the steam pressure here is low and evaporation losses through the narrow gap are not likely to occur.

All in all, this Farymann diesel offers a number of features which will be interesting to O.E.M. people,—its compactness, the fact that it has been built for a number of years and is in successful operation throughout the world, and the added feature that its price is extremely low when bought in reasonable quantities for installation in O.E.M. equipment. Emphasis is again placed on the fact that the distributors in these United States, the Lynn Engineering Company, have no present facilities for making individual sales of this Farymann diesel. They are only interested in obtaining O.E.M. business. They carry a stock of Farymann diesels in this country and a very substantial stock of spare parts, which, of course, will be expanded as soon as the number of engines imported into this country increases.

Flywheel side and above the opposite side of the 6 hp single-cylinder horizontal Farymann diesel, now available in the U. S. A. for O.E.M. equipment only.



Bosch fuel injection unit with plug for injecting ignition helper.



AUTOMOTIVE DIESEL PROGRESS

A COMMENTARY BY MERRILL C. HORINE

Merrill C. Horine, for 38 years a member of the Society of Automotive Engineers, has been actively engaged in automotive engineering, sales promotion and training, advertising and editing of automotive publications since 1907. He has contributed numerous papers on diesel and allied subjects to the SAE and other organizations. An officer in the Air Service in World War I, he was a consultant to the Chief of Ordnance and the Automotive Division of the War Production Board in World War II.

Diesels Must Breathe

Two Part Article

Part 1

IN the constant quest for more power per cubic inch, less weight per horsepower and more miles per gallon of fuel, automotive diesel manufacturers have proceeded along several avenues, one of the most important and basic of which is improved volumetric efficiency or breathing capacity. Just as an athlete's prowess is measured largely by his lung capacity, so also the power output of an internal combustion engine is dependent mainly upon its volumetric efficiency. The more pounds of air compressed in the combustion chamber at the moment of injection, the more fuel can be burned effectively and the greater the expansive force against the piston. No engine, under natural aspiration, can attain 100 per cent volumetric efficiency and every engine shows its maximum at only one speed. This speed, of course is approximately where we find the maximum torque, the highest mean effective pressure and the lowest fuel consumption.

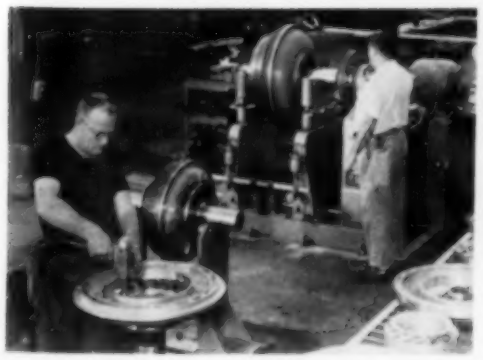
Were it possible to secure uniformly high volumetric efficiency throughout the operating range of speeds, then we would have more wonderful internal combustion engines than we have ever dreamed of. They would have truly flat torque curves, increased power at both the high and low ranges of speed and uniform fuel economy at all operating speeds. The reason we do not have uniform volumetric efficiency is found basically in a few fundamental facts: First, air is highly elastic. It can be stretched as well as compressed. Second, it has weight and consequent inertia. It is reluctant to start flowing and acquires considerable momentum once it is set in motion. Third, it expands when heated, so that a given weight of air occupies more space at given pressure, when heated. Fourth, friction is generated when air is forced through confined passages.

How these phenomena affect the aspiration of air into an engine cylinder can best be understood by tracing in imagination the complete sequence of events on the intake stroke of a four-stroke engine: Upon the closing of the exhaust valve and the opening of the intake valve, at the end of the exhaust stroke, there is a moment when the piston is stationary, after which it starts upon its downward suction stroke, slowly at first and then at increasing speed to mid-stroke, when it slows down again to a momentary cessation of motion at the bottom of the stroke. This produces a partial vacuum in the cylinder and starts the air flowing through the intake valve from the intake passages, intake manifold and air cleaner. Because the air has weight and consequent inertia, it does not start flowing instantaneously, but lags a bit, during which the vacuum in the cylinder increases. Being elastic the impulse travels back through the passages in a wave, so that the full increase in volume taking place in the cylinder is not filled with air at atmospheric pressure; but instead is filled with air at lower pressure.

In its passage through the air cleaner, the manifold, the intake passages in the head and especially in passing through the valve opening, it encounters a great deal of resistance, even though designers attempt to streamline the passages to the utmost. This further attenuates the air. Poppet valves do not fly open instantanously; but because of mechanical limitations, must open and close gradually and remain fully open for no more than an instant, so that the average opening from start to finish is only a part of full opening. This effects an additional restriction on the amount of air drawn in. One thing which has had a controlling effect upon this phase of the matter has been the tendency toward increased operating speeds of automotive diesels. The higher the speed, the more critical cam contours become; the more gradual the ramps and more rounding the cam noses.

Partially offsetting this stretching of the air and its reluctance to flow at the start of the intake stroke, is the continuance of the vacuum in the cylinder after the piston has reached bottom center. This induces a persistence of inflow while the piston travels up again in the early part of its compression stroke. The air, having acquired momentum, tends to continue to flow even after equilibrium of pressure in the cylinder has been reached. If the valves were so timed that the exhaust closed and the intake opened exactly at top center and the intake closed exactly at bottom center, then adiabatically, that is, ignoring the effect of a change in temperature, the engine would be able to attain nearly 100 per cent volumetric efficiency at an extremely low rate of speed, say 1 revolution per minute. But as the speed increased, all of the effects noted would progressively reduce the amount of air that could be drawn in and the volumetric efficiency would steadily decline. Such an engine could run idle at moderate speed; but would develop negligible power.

Accordingly designers arrive at a valve timing plan by which these effects are partially compensated. The faster the engine turns, the longer the vacuum in the cylinder persists after bottom center and the greater the momentum attained by the inflowing air. Consequently the intake valve is permitted to remain open for a greater number of degrees after bottom center, until equilibrium is reached. Just as the intake air has elasticity and inertia, so also the exhaust gas. It takes an appreciable period of time, after the exhaust valve begins to open, before flow of burned gas through it actually takes place. The spent gas in the head passages, in the exhaust manifold, exhaust pipe and muffler is reluctant to flow and must be partially compressed before its inertia will be overcome. It encounters frictional resistance to its flow, so that pressure in the cylinder would persist for some time after the piston has reached top center, if means were not employed to relieve it earlier in the cycle. Any such persistence of pressure would naturally resist any inflow of intake air until late in the suction stroke. By opening the exhaust valve well before the bottom of the expansion stroke, a sufficient period of time is added to the exhaust valve opening to blow down this pressure sufficiently to permit satisfactory scavenging prior to the intake valve opening.



PITTSBURGH, PA.,—"Mountains moved, moderate rates!" Such a claim by an earth-hauling contractor is plausible today, thanks to a lightweight engine auxiliary made primarily of aluminum fabricated by Aluminum Company of America. The auxiliary is a torque converter . . . a device which brings the advantages of fluid-drive power transmission to engines and motors of many sizes. Nowhere is the new-found efficiency of the torque converter demonstrated more dramatically than on massive earth-moving rigs. By multiplying torque when it is needed most, the converters aid the machines in reducing mountains to molehills in a very short time.

The National Supply Company, known as the world's largest manufacturer of oil field machinery and equipment, produces six basic types of torque converters with 17 power capacities, at their Toledo, Ohio, plant. Each consists of three or more sets of precision-cast aluminum alloy elements, affording a smooth transfer of power from engine to equipment through an oil-filled medium. These elements—pump, turbine, and stator—are all close-tolerance products of Alcoa's Cleveland works.

By making possible a "stepless" transmission,' the torque converter eliminates the necessity of continual clutching and declutching on engines which power machinery, just as it does in the modern passenger car. At the same time, it compounds the engine's power output and automatically adjusts it to changing loads. When the job is easy, the torque converter turns effortlessly. When the task gets tough, it whirls into the work, like an extra hand at harvest time. The resulting smoother starts and faster acceleration afford more precise control of machinery, with no overloading or stalling. That adds up to reduced wear and tear on costly equipment.

Behind the proved performance of The National Supply Company torque converters is more than five years of Alcoa research and development work. Plaster mold castings finally evolved in a design with such perfection of detail as to require machining only at easily accessible points. The elements then successfully passed stress analysis tests, when spun at high speeds in a "spin pit." Quality control requires that each of the cast elements pass rigid tolerance tests before leaving Alcoa's Cleveland foundries.

The elements now are being installed by The National Supply Company in single-stage torque converters built in a range from 100 to 1,000 horsepower. With such diversification in range and size, no job is too tough for these aluminum units. Wherever energy is being transmitted by a mechanical clutch, these lightweight "power-packers" have a potential use.

ITS NEW

P. H. Batten Honored

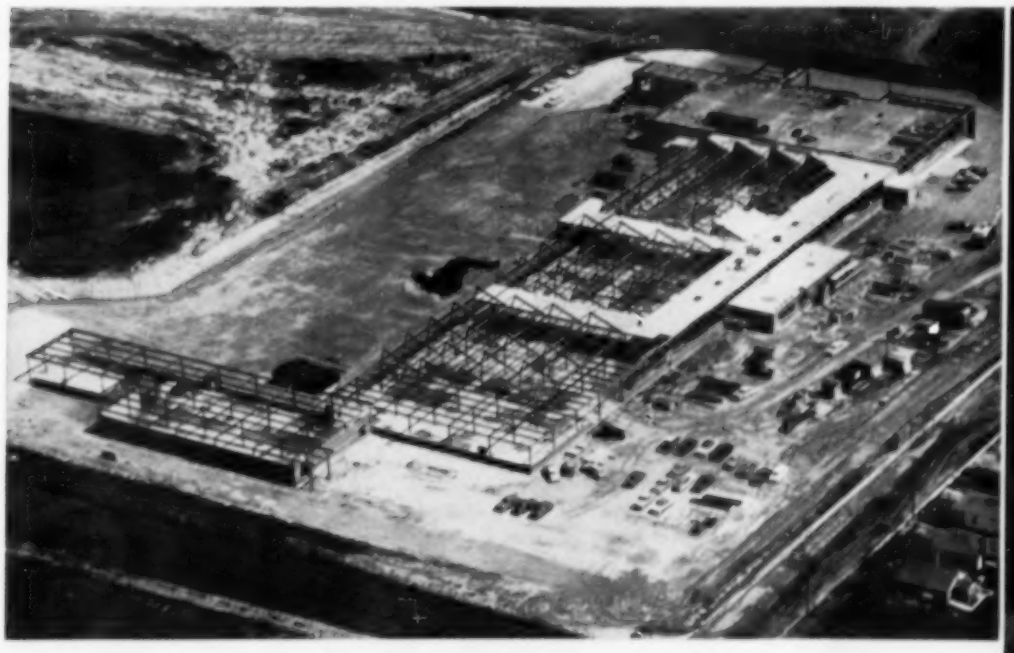
THE Honorable Walter J. Kohler, Governor of Wisconsin, recently formally dedicated a new Twin Disc Clutch Company plant at Racine. At the same time, he gave recognition to P. H. Batten, Chairman of the Board, on the 38th anniversary of his founding of the company. The first unit of this new Twin Disc plant will provide 92,500 square feet of additional floor space. The $2,000,000 structure will be used for expanded production of models now turned out in the original Racine plant and at the Hydraulic Division in Rockford, Illinois.

Designed with an eye toward even further expansion in the future—the plant layout is such that the building can be expanded at least five times. As rapidly as increased demand for Twin Disc products necessitates increased manufacturing facilities, new units can be dropped into place. Location of the plant, on a 22-acre tract, is adjacent to the St. Paul railway tracks, thus providing excellent shipping and receiving facilities.

It was only fitting that Governor Kohler officiated at the ceremonies, for he has worked tirelessly to bring new industries into Wisconsin and to encourage existing industries to grow and expand. It was P. H. Batten who, in 1918, formed the Twin Disc Clutch Company to fill the market requirement for a superior farm implement clutch—for the then infant industry producing powered farm machinery. This was the beginning of an era—an era marked by powerful light-weight horsepower—created by the new and successful applications of internal combustion engines. Through the years, demand for Twin Disc products has not only increased at home, but also developed abroad. Licenses to manufacture certain Twin Disc products were granted to Rolls-Royce of England—and the Niigata Converter Company of Japan.

In addition to manufacturing and testing facilities, Twin Disc operates 7 factory branches, 68 parts stations and 89 authorized hydraulic dealers—all strategically located for fast, dependable parts service and application assistance. Twin Disc products today include friction clutches and power take-offs for applications from fractional to 1050 horsepower—while fluid drives include torque converters, both single-stage and three-stage, for applications from 30 to 1000 horsepower . . . and fluid couplings from ¾ to 850 horsepower.

Airplane view of the new Twin Disc Clutch plant under construction at Racine, Wis.



Gov. Walter J. Kohler (right) congratulating P. H. Batten on the 38th anniversary of his founding of the Twin Disc Clutch Company.

GAS TURBINE PROGRESS

A COMMENTARY BY R. TOM SAWYER

R. Tom Sawyer's well known in the gas turbine field having been the first chairman (1944) (and now treasurer) of the Gas Turbine Power Division of ASME. He spent 7 years with G.E. Transportation Dept., and 26 years with American Locomotive, now Alco Products. At present he is a Consultant, including "Consultant to the Staff" of the Experimental Towing Tank at Stevens Institute of Technology. In addition to being a Fellow Member of ASME and AIEE, he is a member of SAE, ARS, ANS, IME in London, DEUA in London. He is also a member of Franklin Institute and a Professional Engineer. Mr. Sawyer is the author of *The Modern Gas Turbine* and *Gas Turbine Construction*, and co-author of *Applied Atomic Power*.

A gas turbine power unit may be very simple in construction and operation—many are—yet the gas turbine can be extremely complicated, depending upon the efficiency desired, fuel used and its specific application. Let us discuss the principle parts of the gas turbine power plant at this time: 1. *Intake Air Filter and Silencer.* These are built in many shapes and sizes but, generally speaking, the air filter is just a wire screen or highly perforated plate. The gas turbine can take considerable sand and foreign matter providing the particle size is kept small. The general trick in building an intake silencer is to use two or more sound absorbent plates spaced close together so that when the sound comes out it bats itself back and forth a number of times to be absorbed.

2. *Compressor.* The air next enters the compressor which may be of any type, even reciprocating as in the diesel or free piston engine, but normally it is of a high speed rotating type. The two standard designs are centrifugal or axial. Axial compressors have been greatly improved in the past ten years; now producing up to one compression ratio for each stage so that a 12 stage compressor may have a maximum of 12 to 1 compression ratio. Single stage centrifugal compressors used to have a compression ratio of 2 to 1. They are now being built up to 6 to 1 and more. The efficiency of the axial is generally greater than that of the centrifugal but only for a narrow range while the curve of the centrifugal is much flatter. For this reason the axial is generally suited to relatively constant speed and constant load power plants while the centrifugal is well suited to variable speed and variable load units.

3. *Combustor and Fuel System.* The air leaves the compressor at its maximum pressure and then enters the combustor for the addition of heat before entering the turbine. There are many types of combustors. The so called can type is the most popular, being used on aviation turbines with jet fuel, on gas pipe line turbines using natural gas and even on the coal burning gas turbine experiments. These are generally 3 in. to 12 in. in diameter depending upon the size of turbine and the number used per plant. Large stationary turbines, particularly those made outside U. S. A. have one combustor of 3 to 6 ft inside diameter suitable for burning heavy oil. These are mounted vertically to allow for a pit at the bottom to catch any coke or unburned substance, the outlet to the turbine being above the bottom. A diesel engine man may not think of the engine as being a combustor, but from the gas turbine point of view the diesel engine is the combustor for the turbocharger. The Gotaverken and free piston engine both operate on to-day's diesel cycle; both act as combustors, and in their case the hot exhaust gases under pressure turn the turbine which drives the load. The closed cycle combustor is similar to a boiler in that the flame does not touch the air, but heats the tubes containing the high pressure air or gas prior to its entering the turbine. A gas cooled reactor may be used as a combustor with a closed cycle or open cycle gas turbine. Aircraft developments require an open cycle jet unit while stationary power plants and certain portable ones, like marine units, would normally use the closed cycle gas turbine. Liquid cooled reactors may be used wherein the liquid used for cooling the reactor is also used through piping to heat the air in a jet unit or other types of open or closed cycle gas turbine power plants.

4. *Turbine Unit.* This may be of the axial or radial inflow type (reverse of centrifugal compressor). The axial turbine is the only type suitable for large plants while the radial inflow is fast becoming popular for small units; in fact many turbines in turbochargers are of this type. When natural gas or jet fuel is used the axial turbine may be limited to one or two stages. Also one or two stages are used when the inlet temperature is sufficiently high (1400° F or preferably more) to enable the machine to have a relatively good efficiency. An improved efficiency is obtainable on particularly European turbines by having many turbine stages when the hot gas temperature is about 1200° F. When heavy fuel is used it is advisable to have a multistage turbine; for example, a coal burning turbine should have no less than 5 stages so the bombardment of coal and ash particles against blades will be at a minimum, to keep the pressure drop between stages at a minimum.

5. *Exhaust.* The turbine exhaust is seldom directed directly to the atmosphere except in jet planes where the exhaust heat and pressure actually do the work. Normally the turbine is exhausted into a muffler or preferably into and through a heat exchanger which will make the power plant more efficient by utilizing the exhaust heat. There are many methods for utilizing the exhaust heat, as for example producing steam in a boiler, most of

Thermal Brake Efficiency of Single Shaft Gas Turbine Units
Compared to Turbocharged Diesel which has 2 Shafts—Engine & Turbocharger.
No. 2 Diesel Oil or Gas Cooled Reactor Assumed Used in All Cases.

No. 1 Silencer	No. 2 Compressor	No. 3 Combustor	No. 4 Turbine	No. 5 Exhaust	No. 6 Coolers	No. 7 Efficiency
Yes	Cent.	Yes	Radial	Out of Turb.	No	12-16
Yes	Cent.	Yes	Axial	Out of Turb.	No	12-16
Yes	Axial	Yes	Axial	Out of Turb.	No	16-20
Yes	Axial	Yes	Axial	50% Reg.	No	20-24
Yes	Cent.	Yes	Radial	70% Reg.	No	20-24
Yes	Axial	Yes	Axial	70% Reg.	No	22-26
Yes	Cent.	Yes	Axial	85% Reg.	No	22-26
Yes	Axial	Yes	Axial	70% Reg.	Intercooler *	26-30
Closed Cycle	Cent. or Axial	Air Heater	Axial	70% Reg.	Intercooler **	28-34
Diesel Eng.	Cent. & Pistons	Eng. Cylinder	Axial or Radial	out of Turbine	Intercooler ***	32-40

* One between compressor stages ** Also Precooler, air entering compressor.
*** One between compressors and engine pistons on 2 or 4 cycle engine.

which materially improve the overall efficiency of the gas turbine power plant.

6. *Coolers.* The reason for using coolers is for better efficiency. It may be advisable to not use a cooler if simplicity is more important than efficiency, especially in the automotive field or where the equipment is moveable. Coolers may use air, water or other liquids. The closed cycle requires that a cooler be used prior to the air or gas going into the compressor to establish the original inlet temperature. Inter-cooler between the first and second stage centrifugal compressors in a plant is usually helpful. Turbocharged diesel engines are using coolers more frequently between the outlet of the turbocharger compressor and inlet to the engine cylinders, whose pistons further compress the air. This is particularly advantageous on highly turbocharged engines in any class of service, particularly marine and stationary where real cold water may be obtained.

7. *Efficiency.* The table illustrated shows the relative Thermal Brake Efficiency of the various types of gas turbine units. Only these types with single shafts are shown. There is no question but better efficiencies may be obtained by compounding the gas turbine with several compressors, turbines and even more than one combustor. These combinations are generally considered for large stationary power plants of over 10,000 kw. In automotive practice it is common to use a split shaft. For example if a 2 stage turbine is used the shaft is split between No. 1 and No. 2 stages so No. 1 stage drives the compressor and No. 2 stage drives the vehicle. If we test such a turbine we find its efficiency the same as that of a two stage turbine on the one shaft, not split. The same efficiency is at full load only. At reduced loads the efficiency is reduced but the turbine with the split shaft will be definitely better than the one with the single shaft, another reason for using the split shaft turbine. A power plant should not be selected for efficiency only, so in the next issue gas turbine applications will be discussed.

Herrin Adds Diesels

Today, the Herrin Transportation Company, of Houston, Texas has grown until it is one of the largest common freight carriers in the Southwest. Its 562 unit fleet fans out from 23 sprawling, teletype-connected terminals to blanket five states—Texas, Louisiana, Mississippi, Arkansas and Tennessee. From the time of his modest start in the lean year of 1931, Robert T. (Bob) Herrin, President of the Company, recognized the need for fast, dependable and low-cost freight transportation for shippers of the South. The steady growth of the company, which now has some 600 employees, best illustrates his success in providing this service. One of Herrin's fundamental concepts is that his company must have nothing but the very finest of modern equipment to achieve maximum efficiency. From the two-way radios in all city delivery trucks to the specialized tools in the maintenance shops, the electronic tabulating machines in mural-decorated offices and where business is built—on the road—Herrin has adhered to his basic idea. He is currently not only carrying out his routine replacement program, but is increasing the size of his fleet. The company's outstanding reputation for efficient freight handling and the terrific stimulus to Southern trucking caused by the South's booming industrialization make expansion necessary.

For quite some time Herrin and his right hand, W. C. Padfield, General Superintendent and Purchasing Agent had been considering a trial of one of the new, smaller diesels to see if it would prove to be the money maker in his fleet that it has proven to be in others. Late last fall they selected a Diamond T Model 723CJT Tilt-Cab tractor powered with the Cummins JT-6-B diesel. This lightweight turbocharged diesel develops 175 hp.

The unit was put through an exhaustive over-the-road test on the company's most grueling runs and soon proved the extra profit-making potentialities of this latest Diamond T diesel. The penny-pinching fuel mileage delivered by the Tilt-Cab diesel was immediately apparent—more than 7 miles per gallon, with a GCW of 58,000 lbs! This figure exceeded Herrin's and Padfield's expectations somewhat, even considering the favorable factors of fairly flat terrain and not too burdensome traffic conditions.

The 723CJT chalked up a bonus advantage on the debit side of the ledger—an increase in payload. With more weight on the front axle, the Tilt-Cab design makes this added payload and revenue possible without exceeding common legal restrictions on axle loading. Test results and drivers' opinions were the factors upon which the decision to buy more 723CJT's was formed. At the present time Herrin has 48 of these Diamond T Tilt-Cab diesels in operation and on order, and plans call for more to be added as present equipment reaches retirement age. For, as Mr. Herrin puts it, "I am convinced that the 723CJT is The tractor for profitable over-the-road operations for Herrin Transportation Company."

Increase in fuel mileage and gain in payload are important—vitally so—but equally important is the morale of the drivers. Mr. Herrin emphasizes most emphatically that the continued success and future progress of the firm are directly contingent upon employee efficiency. The 723CJT's have been awarded to Herrin's top drivers who are lavish in their praise of their new orange and black trucks, reporting "they ride better and handle easier" than any tractor they have ever driven."

Gosden To Houston For White

The appointment of Louis A. Gosden as Gulf Coast representative was recently announced by White Diesel Engine Division of the White Motor Company. Gosden will maintain headquarters at the Division's Houston, Tex., branch office. He will handle sales and service of gas and diesel engines and diesel electric drilling rig units.

A new diesel fuel additive, designed specifically to increase the operating efficiency of diesel engines

is currently being marketed by Harflo Products, Ardsley, Pa. FUEL-AID is claimed to be a combination of carefully selected high-grade compounds that are completely combustible with diesel fuel.

It is non-explosive, non-poisonous, non-corrosive, contains no sulfur and will not effect cetane rating or efficiency of diesel fuel.

When used as directed, FUEL-AID claims it will eliminate clogging of injectors by carbon, gum and wax; aid in proper complete combustion, thus better fuel economy and engine performance; eliminate hard starting, pounding, excessive smoking; keep fuel tank, lines and filters free of gum, sludge and wax; and, eliminate rust and corrosion. FUEL-AID contains no ingredients that might prove harmful to delicate diesel systems. It contains inhibitors that minimize corrosive acid formation and that prevent the polymerization or solidifying of gums and varnishes. By keeping these natural oxidation products in a liquid state, suspended and dispersed throughout the fuel, it prevents their deposition in the lines or on the mechanisms and permits them to be carried to the filtration system. FUEL-AID also provides a more uniform friction coefficient, thus reducing the effect of climatic temperature on fuel flow.

By absorbing moisture or water present in the fuel tank, FUEL-AID claims to prevent the formation of sludge, breaks up sludge which may have already formed and eliminates corrosion from this source. FUEL-AID can be added directly to the fuel tank or mixed with the diesel fuel. Two quarts are added to the first 50 gallons of fuel. Thereafter, only a quart need be added to each 125 gal. of fuel.

ITS NEW

West Coast News

By James Joseph

TO BRAGG CRANE Service, Long Beach, Calif., a 110 hp model HRCI-400 Cummins diesel engine for hoisting in a P & H mobile crane propelled by an HR-600 Cummins. Sale by Cummins Service & Sales, Los Angeles.

LOADED ABOARD the liner *President Cleveland* on Sept. 15, 1956, was final shipment of 1200 kw Union diesel generating equipment destined for new mine operation at Rapu Rapu, Republic of Philippines.

FOR V. R. SCHEUMANN'S new, 50-ft Ben Seaborn-designed sloop, now under construction at Seattle's Vic Franck yards, a GM 4-51, 87 hp diesel auxiliary.

PORTLAND, OREGON'S Shaver Transportation Co. has installed two right-hand rotation 6DAMR-844 Buda diesels in a new tug operating the Willamette and Columbia rivers. Marine gear is Twin Disc with 3:1 reduction.

EASTON, WASHINGTON'S C. C. Handley recently repowered his 1951 White logging truck with a 4-71 GM diesel. Sale via Seattle's Evans Engine and Equipment Co., Inc.

UNION DIESEL'S Charles Firth returned recently from six months in Korea where he supervised installation of four municipal power plants, all Union dieselized. Mr. Firth also looked over jobs in Hongkong, Manila and Honolulu.

FOR JOHNS-MANVILLE Products Corp., Lompoc, Calif., a 95 hp Model J-6 Cummins diesel engine to replace gasoline engine in a Kochring motor crane.

TO GUY F. ATKINSON Co., Swift Creek, Washington, a new 54-B Bucyrus-Erie with 8DAS-1125 Buda diesel, and Torcon convertor. Sale by Portland's Hamilton Engine Sales, Inc.

LEONARD HALL, Charleston, Oregon, has taken delivery of a 125 hp Model JN-6-M Cummins engine for powering his fishing boat. Sale by Cummins Diesel Sales of Oregon (Portland).

TO REPOWER HIS sawmill located at Lake Chelan, Wash., N. G. Gallagher (of Chalan) has taken delivery of a 6031C GM diesel.

FOR WALT DECKER Logging Co., Roseburg, Oregon, a new LS-108 Link Belt with Buda-Allis Chalmers model 6DA-779 diesel engine (with Twin Disc Torque convertor transmission and disconnect clutch). Air tongs were installed on the machine; also a 40 cu ft Quincy air compressor for driving a special pulley installed on front of crankshaft.

GILBERT LOGGING Co., Sweet Home, Ore., has repowered a crawler tractor with a 6DAS-844 Buda diesel with deep sump pan for angle operation, in conjunction with Twin Disc torque convertor.

FOR THE FISHING boat "Virgie J", a 125 hp Model JN-6-M Cummins diesel engine. Boat's owned by William Conley, North Bend, Oregon.

JAY-MAR LUMBER Co., Walla Walla, Wash., has purchased a new Le Tourneau "Log Stacker" with 6DAS-844 Buda diesel for operations in firm's yards at Walla Walla.

FREI BROS., Langley, Wash., have traded in their 7-year old 120 hp GM 4-71 for a new GM 6-71, 6030C power unit.

TRIALS FOR THE State of California's new ferry boat, "Carquinez" are scheduled for early November. Ferry's installed with a 1000 hp Union diesel engine.

FOR REPOWERING Earl Schenck, Jr.'s 50-ft steel, German-built "Eleuthera", an 87 hp GM model 4-51.

LaRo LUMBER CO., Burnt Woods, Ore., has installed a Buda 8DA-1125 power unit to pull its head rig; and edger mill is now cutting some 40m to 45m feet daily, this about 10m more than previous production from same unit.

TO TIDEWATER Oil Co., San Francisco, a Fairbanks-Morse Model 49B4¼, 180 hp diesel generating unit.

HONOLULU'S P. S. Pell & Co., Ltd has taken delivery of four Fairbanks-Morse model 45B3¼, 5¼ hp generating sets.

Sales Staff Addition

Alco Products, Inc. announced today the appointment of John A. Langford to the company's Los Angeles sales staff. Langford, who lives at 839 South Helena Street, Anaheim, Calif. is a native of Los Angeles and a graduate of Fullerton Junior College, the California Institute of Technology and Stanford University. He holds a bachelor's degree in electrical engineering from Stanford. In his new position with ALCO, Langford will handle the company's broad range of products, including railroad locomotives, thermal products and ordnance materials. Langford is 32 years old and a veteran of four years' service in the Navy as a lieutenant, junior grade, during World War II. Langford is a member of the Methodist Church and the Benevolent Protected Order of Elks in Anaheim and the North Orange County YMCA.

Blower Bulletin

Four-page, two-color, letterhead-size bulletin B-154A (newly revised) contains selection charts and other useful engineering information pertaining to the Standardaire blower, a modern compressor adaptable to either pressure or vacuum service. Selection charts give the blower model, brake horsepower and rpm needed to provide specified air-moving capacities in cfm at required pressures in psig or vacuums in inches of mercury. The Standardaire will handle air, gas or vapor, as modified for each particular service. Write Read Standard Corp., Blower Div., 570 Lexington Ave., New York 17, N. Y. for this bulletin. (ITS NEW)

New Starter Fluid

The new super-hot formula of Sure Fire Motor Starting Fluid now gives faster, safer starts to any gasoline or diesel engine in temperatures down to 65 degrees F. below zero. Sure Fire comes packaged in two different containers: a pressurized 12-oz. self-dispensing container; and in a pint can with a separate easy-to-use, metal sprayer. Sure Fire's low-ether content formula protects engines against upper cylinder area damage and reduces engine wear by eliminating slow, hard starts in damp or cold weather. It reduces down time of men and equipment and prolongs life of batteries and starter equipment.

Developed by the Wilco Company of Los Angeles after many years of research, Sure Fire is unequalled among starting fluids as being the most economical and surest method of quick starting. The sprayer provides an easier, safer, low-cost method of fluid application by simply spraying directly into manifold or air intake. The new product can also be used with a permanent injection system by merely pouring the fluid into the capsule reservoir.

Art McNeill, vice-president of the Industrial and Commercial Division of Wilco, reports one of the most important features of Sure Fire is its low ether content, making it perfectly safe to ship and warehouse. The pressurized can meets all ICC requirements and is approved by the New York City Fire Department. Also, McNeill states Sure Fire has been especially blended to give smooth starts with minimum detonation. A year-round product, Sure Fire works equally well on gasoline and diesel engines of all sizes, including power mowers, outboards, chainsaws, cars, trucks, tractors, marine engines and construction equipment. Further information may be obtained by writing: Wilco Company, Industrial and Commercial Division, 4425 Bandini Blvd., Los Angeles 23, California. (ITS NEW)

Unique New Vessel

A unique triple-screw 2000 hp vessel that is expected to cause a stir in the Caribbean shipping trade is presently on the ways of the Osaka Shipbuilding Co., Ltd., of Osaka, Japan. Destined for use as an ocean-going salt carrier, the new ship is being built for Inagua Transports, Inc. of Inagua, Bahamas. It will be called the *Cecile Erickson*, in honor of the mother of the founders of the firm. Construction of the new ship began early this year. It is expected to be completed in November, 1956.

The *Cecile Erickson* will be powered by four standard Caterpillar turbocharged D397 marine diesel engines, each developing 500 hp at 1225 rpm. The two inboard engines will be compounded through a Lufkin Marine Gear and compound to drive the center screw by means of a 170 mm steel shaft. Each of the outboard engines will drive a separate propellor through its own Lufkin gear. Tailshafts to all three propellers are 210 mm steel with 9.5 in. O. D. Bronze liners. Provision has been made in the design for the addition of two more D397 Engines in the future if desired.

Other equipment to be installed on the new vessel includes two Caterpillar D342 marine electric sets, each capable of producing 100 kw at 1200 rpm. Salt will be handled by two Thew-Lorain clamshell cranes powered by Cat D315 Engines. The cranes will be carried as regular equipment. The new ship will have a length of 344 ft 6 in., breadth of 50 ft 6 in. and a loaded draft of 20 ft 4 in. It will have a cruising speed of approximately 12 knots fully loaded. Sufficient fuel will be carried to cover a distance in excess of 4,000 statute miles. Cargo capacity will be about 5200 long tons in three holds. The ship will be manned by a crew of 8 officers and 16 men.

Sales Engineer

William J. Fritton, Vice President-Sales, Van der Horst Corporation announces the appointment of Frank L. Jorstad as Sales Engineer for the Mid-West territory. Mr. Jorstad will be headquartered at the Van der Horst Corporation's new Chicago plant at 2610 South Shields Avenue. Mr. Jorstad is an Administrative Engineering graduate of the University of Denver 1950.

New Orleans News

By James L. Leslie

GRAVITY DRAINAGE District, Lake Charles, La., has purchased four model 38D8, six cylinder, 1000 hp dual fuel engines from the New Orleans division of Fairbanks, Morse and Company.

FAIRBANKS, Morse and Company have also sold eight Model 38D8⅛, 12 cylinder, 19,200 total hp and six Model 38F5¼, five cylinder, 2,250 hp diesels to Avondale Marine Ways, Inc., New Orleans.

CUMMINS SALES and Service, Inc., New Orleans, recently sold a 400 hp NVHM-1200 Cummins diesel for installation on the tug "Grand Pass" by the Benoit Machine Works.

THE ROWAN DRILLING Company of New Orleans are recipients of three 100 kw Electric Machinery generators to be powered by three Waukesha Model WAKD diesels, sold by the Reagan Equipment Company of New Orleans.

T. L. JAMES COMPANY of Ruston, La. recently purchased a M5AD Michigan tractor shovel, powered by Waukesha model 135 DKB diesel from Reagan Equipment Company of New Orleans.

DELTA EXPLORATION COMPANY of New Orleans is now using a Waukesha Model 190 DLCU diesel, which it purchased from Reagan Equipment Company of New Orleans.

SALTWATER CONTROL of New Orleans has in operation a Waukesha Model 190 DLCU diesel engine as part of control equipment. It was purchased from Reagan Equipment Company of New Orleans.

J. RAY McDERMOTT, Inc. has purchased five Electric Machinery single phase five kw 115 volt, 1200 rpm generators driven through a fork flywheel coupling by a Waukesha Model 180 DLCU diesel.

REAGAN EQUIPMENT COMPANY of New Orleans is in process of delivering an Electric Machinery 500 kw three phase 4160 volt, 900 rpm generator with a fork flywheel coupling and a Waukesha Model VLRDBS 12 cylinder turbocharged diesel engine to Freeport Sulphur Company of New Orleans.

WIN HAWKINS Drilling Company has purchased from Reagan Equipment Company of New Orleans a Waukesha Model VLR DSU 12 cylinder diesel rated at 1135 hp at 1200 rpm and secured through the United Supply Company of Tulsa, Okla.

CENAC TOWING Company has purchased a Waukesha Model 180 DLCU diesel to drive an 8" Gardner-Denver barge loading and unloading pump.

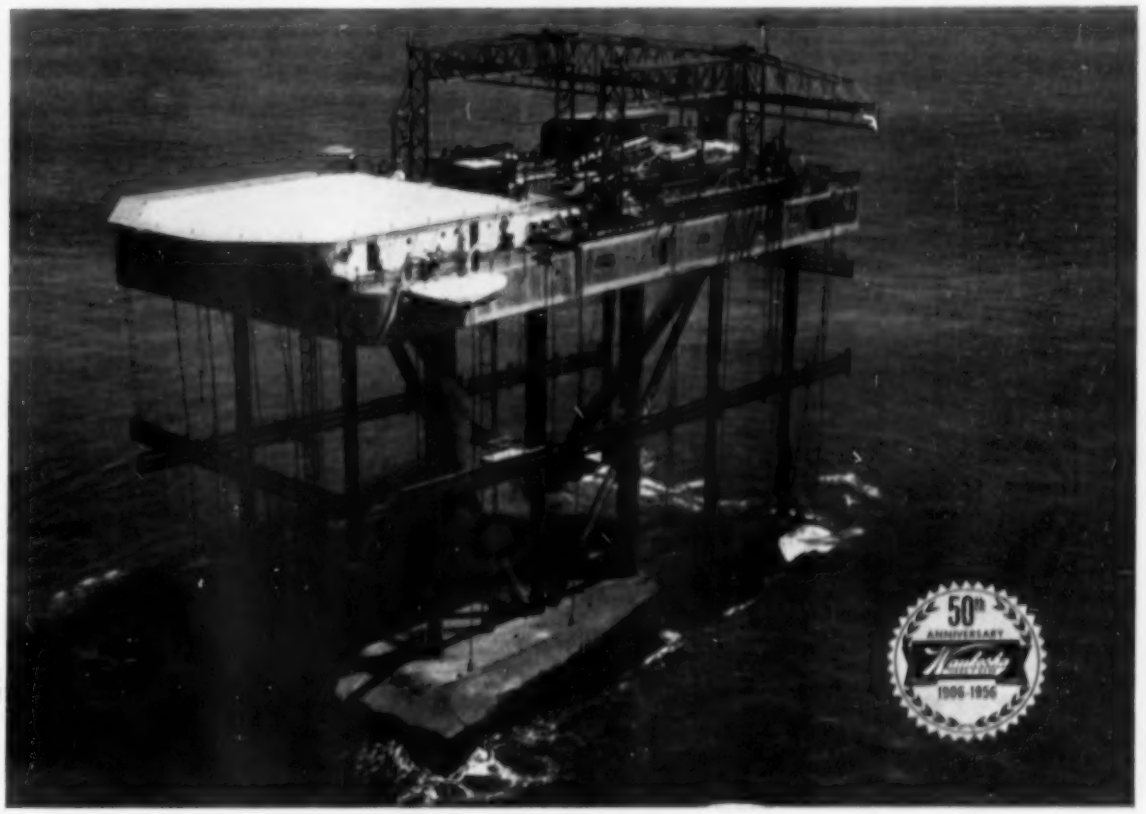
AN AZORE ISLANDS airfield will get the benefit of two Model 148 DKU Waukesha engines recently purchased by the Walter Barnes Electric Company to drive two 75 kw Electric Machinery generators.

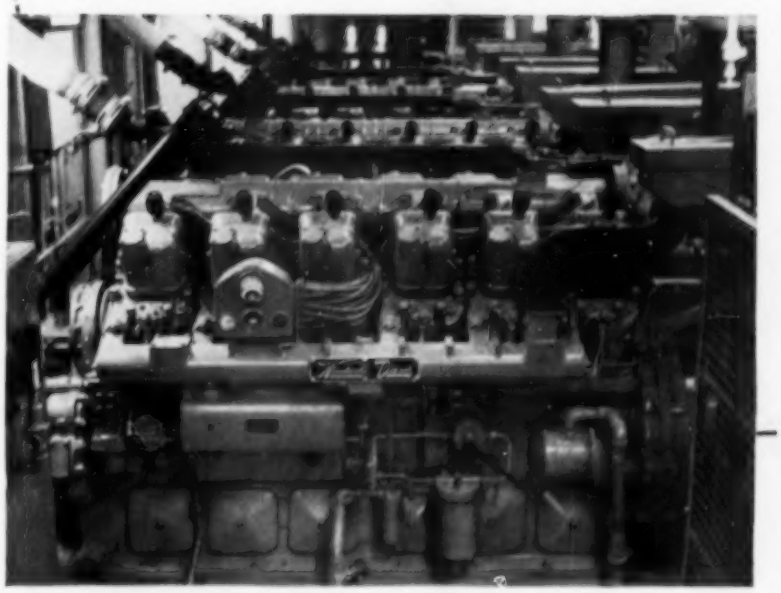
THE J. C. ARMATURE Works of Houma, La. will supervise installation and switchboard arrangement for the Cenac Towing Company's two new 30 kw diesel generator sets driven by Waukesha model 135 DKB full diesels. Reagan Equipment Company of New Orleans made the transaction.

THE REAGAN TOOL Company of Morgan City, La., has just received two Waukesha model 135 DK DSM full diesel marine engines with 4:1 Capital marine gears to be used in 45 ft tugboat now under construction.

4 Big WAUKESHA V-12 *Turbodiesels*

Power this NEW OFFSHORE DRILL RIG





The 4 big Waukesha VLRDBSU 5788 cu. in. Turbodiesels

● This elevated deck offshore barge was built for the California Co. by Avondale Shipyard; drilling equipment and operation by the Noble Drilling Corporation. Oil men who have seen this remarkable equipment were much impressed by the array of big Waukesha Turbodiesels which are the prime source of power.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
New York • Tulsa • Los Angeles
319

Inland River Reports

By A. D. Burroughs

ALL INDICATIONS point to continued diesel activity and interest along inland rivers with the current building boom underway at shipyards expected to ride its present crest far into the new year. Further extensive expansion in the chemical, aluminum, coal, paper, and power plants all along the waterways offer solid foundations for continued reign of the Diesel King in this phase of the industry.

PETE (P. L.) BARRERE, from Cleveland Diesel Engine Division, was on hand with the welcome greetings for the open-house inspection of the new towboat, *E. E. Smith*. Built by Missouri Dry Dock and Repair Company for Smith Oil and Refining Company, this 152 x 35 x 10.6 vessel will be operated by Missouri Barge Line Co., Cape Girardeau. Twin G-M (Cleveland) model 12-567A engines supply the rated 1800 hp.

THE KEEL has been laid at Dravo for the second Mechling towboat, reported to be identical to the recently launched 2400 hp towboat, *Lynn B.* newest diesel fleet addition for A. L. Mechling Barge Line. The *Lynn B* is equipped with two Enterprise engines.

AN ORDER HAS been placed by Inland River Company with Bludworth Shipyard, Houston, Texas, for a new 1200 hp twin-screw towboat, reportedly similiar to the recent Bludworth production, *Julia D.*, delivered last July to the Tennessee River Towing Corporation.

THE *J. B. CHAUVIN*, newest diesel towboat addition to the famed Chotin fleet was recently christened at Nashville Bridge Company. Three Fairbanks-Morse OP engines provide the rated 1800 hp for this 96 x 28 ft craft named in honor of Capt. Julius B. Chauvin, Baton Rouge.

A PAIR OF Cummins NRT-6-M turbocharged engines developing 600 hp supply propulsion power for the new twin-screw towboat, *Sooner*, completed recently at Barbour Metal Boat Works, St. Louis, for Buckeye Towing Company. Measuring 54 x 20 x 6½ ft, the vessel is on duty in the St. Louis harbor.

TWO "NEW" diesel vessels, Glenn Crain's *Quaker State* and Charles Zubik & Son's *Virginia* are, in effect, the reincarnation of the long-known diesel towboat *Tennessee* built in 1939 at the Marietta Manufacturing Co. The vessel was split at Zubik's landing on the Allegheny River, with the front half resulting in the Crain vessel, the back half into the Zubik craft.

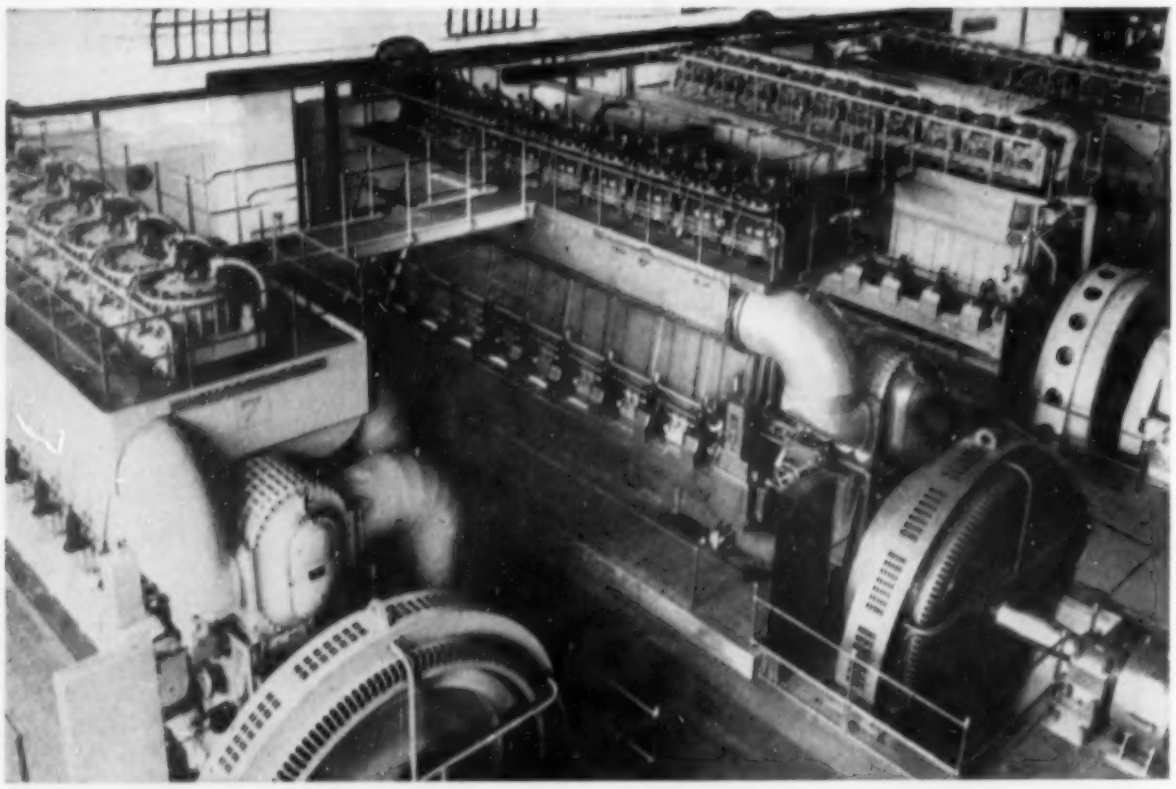
REDDY K IS reported to be the new name for the *Billy Potts, Jr.*, powered with GM diesels totalling 330 hp. Built in 1950 by Hillman Barge and Construction Co., this diesel towboat was formerly owned by W. F. Potts, now owned by Ohio Edison Company.

THE *FRANCES K.*, built in 1947 by Greenville Manufacturing and Machine Works, and now owned by Brent Contracting Company, Inc., Greenville, Miss., has been rebuilt, repowered with two 330 hp Cummins engines, and renamed the *Happy O'Hara*.

THE *ILLINI*, owned by Illinois Farm Supply Co., has been active on the lower Mississippi River, seen upbound using to advantage the 2200 hp from the Cooper-Bessemer JS-6 engines. Built by Jeffersonville Boat and Machine Co., in 1949, this 115 x 30 x 10.2 towboat has been a regular performer on inland waterways.

THE *ESSO LOUISIANA*, 1947 Dravo production measuring 166 x 35 x 10.5

Look to COOK for Better Rings!



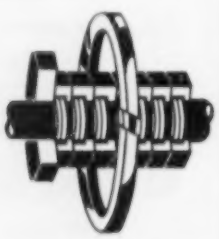
After 25,037 operating hours... Cook rings good for 10,000 more!

HERE'S the result of a cylinder inspection by Rockville Centre, N. Y., municipal power plant officials. It's a report on their No. 8 Diesel unit after almost three years of continuous operation.

"While several rings were replaced in Grooves 1 and 2, Cook rings in Grooves 3, 4, 5 and 6 could run for another 10,000 hours! And cylinders averaged less than .001" maximum wear per 1000 hours of operation."

Light-tight Cook Piston Rings prevent scuffing and blow-by . . . conform perfectly to the cylinder wall because they are re-turned as a final manufacturing process. In addition, Cook rings are tensioned by an exclusive, gentle "squeezing" process that guarantees constant, uniform tension — *for life!*

For complete information on Cook Piston Rings and name of nearest representative, write: C. Lee Cook Company, 912 South 8th Street, Louisville 3, Kentucky.



C. LEE COOK COMPANY

A Subsidiary of Dover Corporation

Rings and Packings Since 1888

ft, was active in the same area, southbound on the Mississippi for her owners, Esso Standard Oil Company with propulsion power provided by the supercharged Superior engines, totalling 2000 hp.

THE 1954 ADDITION to the Sinclair Refining Company fleet, *Sinclair Memphis* was spotted in the active oil trade service on the Illinois waterways, with good performance obtained from the Enterprise engines rated at 900 hp.

REPORTS FROM Dravo reveal that the power for the towboat under construction for delivery to the Canal Barge Company, Inc., New Orleans, will be supplied by two GM (Cleveland) 12-567 engines.

RECENT CHICAGO fanfare sent the new 110 ft *George W. Lenzie*, new towboat built by Calumet Shipyard and Dry Dock Company, into service on the Illinois waterways for the owners Material Service Corporation. Named for the Material Service director and vice-president in charge of productions, two Nordberg Superthermal engines rated at 800 hp each supply the power for the planned loads of 12,000 tons each, and still hold an upstream speed of six mph. Two G-M (Detroit) 6-71 Series 60 kw generators provide the electric power for this new towboat.

LITTLE 9-YEAR-OLD Sandra Marie Schelot christened her towboat namesake, the 85 x 26 x 9½ ft vessel, the *Sandra Marie*. Built by Christy Corporation, Sturgeon Bay, Wis., for owners S and S Marine Towing Company, Joliet, Ill. (headed by H. V. Schreiner and N. G. Schelot), this craft is destined for Illinois waterway service, reported to be the first of its kind equipped with the new Kahlenberg Model E turbocharged diesel engine.

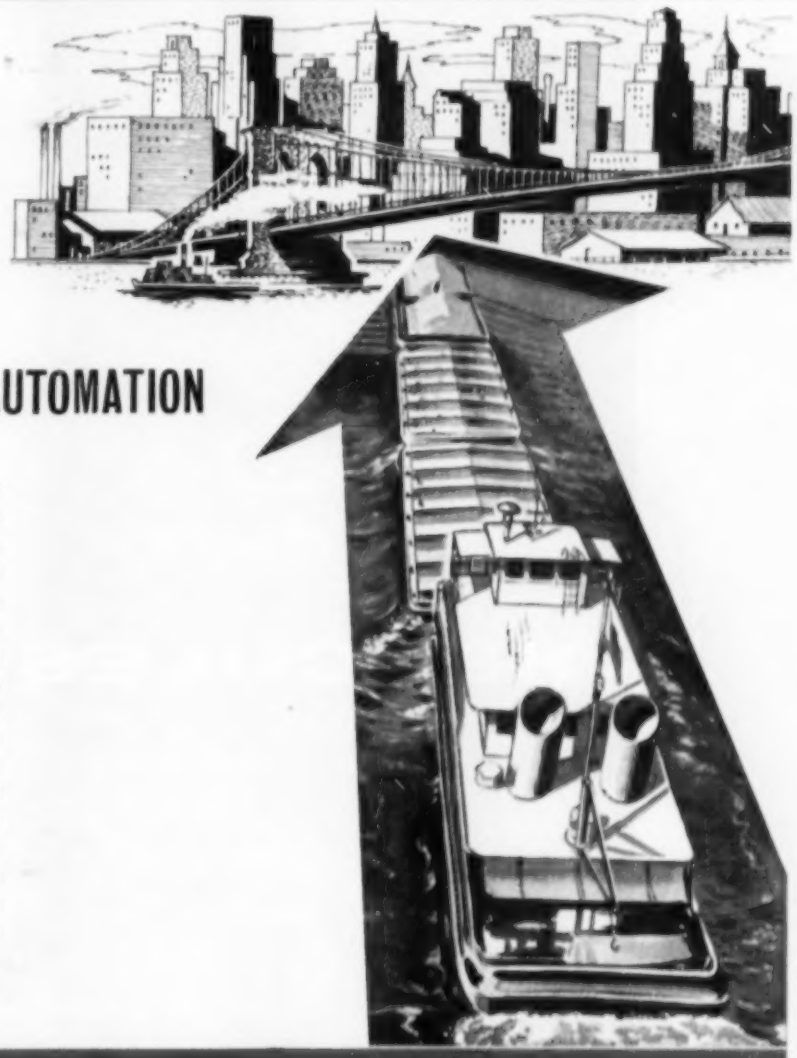
Weston Los Angeles Office

Weston Electrical Instrument Corp., a subsidiary of Daystrom, Inc., announces the opening of a Los Angeles area branch office September 1, just following the firm's participation in the Wescon Show. The new facility, Weston's first in this area, marks the corporation's awareness of the need to more completely service rapidly growing Southland industries.

Operations of the branch headquarters will include instrument field service, a complete instrument repair department under factory control, prototype modification service, instrument sales and application engineering, and maintenance of instrument stocks to assure prompt local delivery on many Weston items.

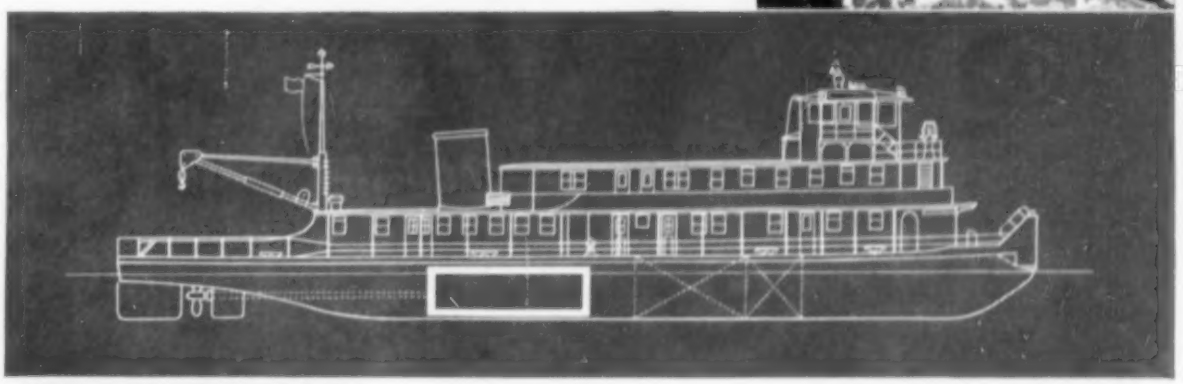
Argentina Buys

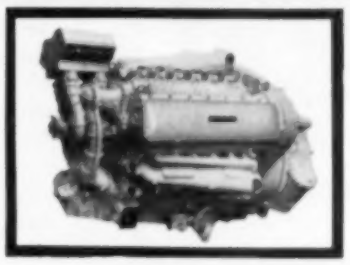
White Diesel Engine Division announced today it has received an order from Argentina for four engine-generator sets valued at more than $450,000. They were purchased from the White Motor Company Division by the Sociedad Industrial Americana Maquinaris di Tella, Ltda., of Buenos Aires. This is the second major South American order announced by White Diesel in recent months. It shipped two mobile engine-generator sets to Venezuela in July, the first ever purchased by that country. General Manager William F. Burrows of White Diesel said "these shipments are the result of our concentrated efforts to win a major share of Latin American business. Several other large orders are now being negotiated." The engine-generator sets are each rated at 1250 kw. They will be used to provide power in several plants operated by Sociedad Industrial, which manufactures and distributes electrical equipment, machinery and pumps. The turbocharged White engines are model 80-SX-8 Superior diesels. Each is rated at 1765 hp, 375 rpm, and has a 14½-inch bore x 20-inch stroke.



TOWARDS MARINE AUTOMATION

The locked engine room—dream of every towboat operator, builder and engineer—is brought nearer to reality by the use of Napier Deltic engines. On Deltic-powered towboats you can have complete, instrumented Pilot and Engineers' Remote Control Stations—a big step towards marine automation. There are other equally important reasons for using Deltics. They reduce vessel layup and increase earning capability. When a major overhaul is needed the low weight and compactness of the Deltic permit engine replacement in a few hours. Deltics (825-2,500 s.h.p.) have the best marine Diesel power/weight ratio in the world. Get in touch now with Napier's representative. He'll tell you more about the advantages of using Deltic Diesels.





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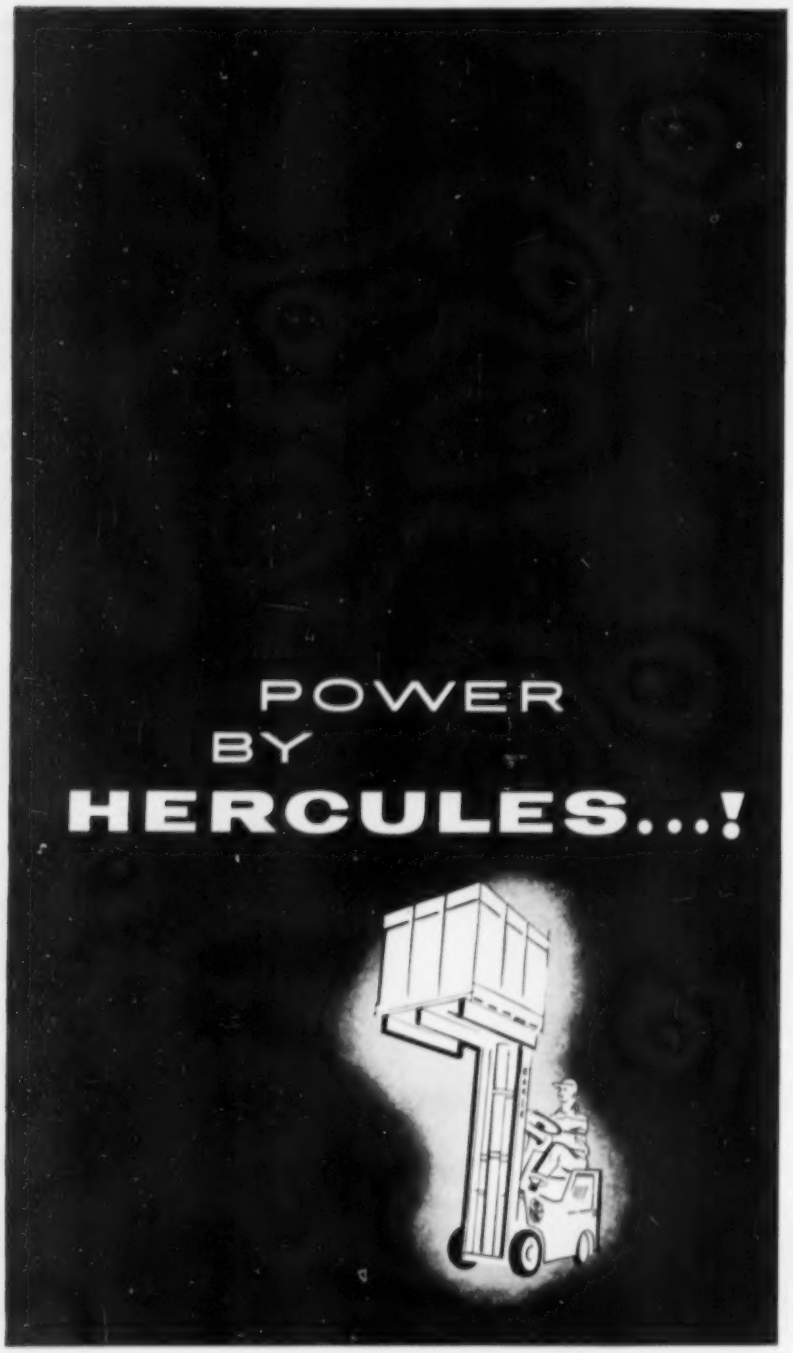


BAKER Industrial Trucks rely on . . . POWER BY HERCULES. These rugged trucks demand a compact, heavy-duty power plant. That's why Hercules Gasoline and Diesel Engines were selected as standard in Baker equipment.

The wide selection of Hercules Engines—over 90 models from 3 to 500 H.P.— provides a proper size of engine to meet your power requirements.

For power "tailored" to your needs, specify . . . POWER BY HERCULES.

HERCULES MOTORS CORP. • CANTON, OHIO

Koehring's New Excavators

An attractive catalog describing a newly designed 25-ton lift, ¾ cu yd dipper capacity 305 excavator has been released for general distribution by the Koehring Company, construction equipment manufacturer. The 8-page, 2-color catalog tells the story of design, construction, work capacity and application of the new heavy-duty excavator. Copies are free. Well illustrated with 26 photographs and diagrams, the catalog gives concise descriptions of the Model 305 when equipped as a shovel, crane, hoe or dragline. The unit is available either crawler mounted or on a truck chassis. It carries a rated lift capacity of 25 tons on rubber, 15 tons on crawlers, and can be equipped with a full compliment of attachments. Copies of the new catalog may be obtained from any regional Koehring distributor or by writing direct to the Koehring Company, Milwaukee 16, Wisconsin. ITS NEW

The 66-foot PACIFIC RAIDER, salmon fisher and purse seiner, owned by John Jerkovich, Sr. of Gig Harbor, Washington. The craft was repowered with a GM 6-110 Detroit diesel engine which has increased the craft's cruising speed from 8.5 to 10 knots. The diesel, supplied by Evans Engine and Equipment Co., Inc., of Seattle is equipped with General Motors new Hydrostarter. This hydraulic starter eliminates any need for starting batteries aboard.

Fast service work and parts for the users of General Motors diesel engines in Florida, is now assured by Ellis Diesel Sales & Service of Fort Lauderdale. Nick Trombetta, the pilot of the Fairchild airplane is also a diesel technician and is often called upon to fly to some remote part of the Everglades or to a small island off the Florida coast. When not working for the diesel engine industry the plane is used in Civil Air Patrol work.

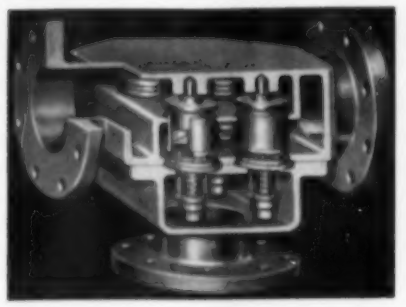
Noble To Sharples

James A. Noble

The Sharples Corporation, Centrifugal and Process Engineers, Philadelphia, Pennsylvania, has announced the appointment of James A. Noble as District Sales Engineer for The Sharples Corporation Western Division, Burlingame, California. Mr. Noble, who has had wide experience in process development and application of centrifugal equipment in the chemical, marine, vegetable, oil, food and other process industries, will work out of the Western Division offices at 1100 Carolan Avenue, Burlingame, California, and service industries from Los Angeles north.

J. H. Beers, Inc., Bangor, Pa. contractor, is employing this LeTourneau-Westinghouse Model "C" Tournapull and two companion units to accomplish a 140,000 cubic yard earthmoving project north of Philadelphia. Sections of a state highway are being elevated to offset the possibility of flood when a water reservoir is formed in adjacent lowlands with the completion of Greenlane Dam. Contractor reports the Detroit dieselized Tournapulls are moving up to 4,100 cubic yards of fill per day. The new dam is to provide a reserve water supply for suburban Philadelphia.

Granitic appearance of Detroit's city skyline provides an unusual setting for this 1956 model Chris-Craft pleasure cruiser, the ERIKA, delivered recently to the P. K. Mebus Land Co. of Detroit. The craft is shown getting a work out on the Detroit River before taking on company guests for an overnight trip to vacation waters of northern Lake Huron. A deluxe Chris-Craft Constellation model, the 54-foot ERIKA accommodates ten overnight guests and has a cruising range of 325 miles. Two 6-71 Detroit diesel engines, turning 24" x 29" screws through 2 to 1 reduction gears, give the craft a top speed of 21.5 mph. She flies the burgee of the Detroit Yacht Club, under the command of Captain Duke Forrester.



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SAFETY	Provided for by multiple independent elements as shown above.
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MODELS	½" to 6" pipe sizes. Larger sizes in iron, bronze or ductile iron.

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FACTS PROVED ON NEW 95' COAST GUARD PATROL BOATS

Water, water-oil emulsions and abrasives are a definite . . . and preventable problem on sea-going vessels. Here's a new and enlightening report on how to remove water and abrasives without materially affecting flow of fuel. This new report is full of data that will give you some amazing answers. Write for it today.

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Ken Self Moves Up

Kenneth W. Self

Announcement of the election of Kenneth W. Self to the office of Vice President of Freightliner Corporation of Portland, Oregon, manufacturer of White-Freightliner trucks, was made by Thomas D. Taylor, President. Self has been active in heavy duty motor truck maintenance and manufacturing circles for over 20 years. He started his career as an apprentice mechanic in 1935, building bus bodies at Novelty Carriage Works in Spokane. He joined Freightliner Corporation's parent company, Consolidated Freightways, as a maintenance mechanic in their Spokane shop in 1940, and has successively been Assistant Shop Foreman, Maintenance Superintendent, Service Floor Foreman, Shop Superintendent, Production Manager, and now Vice President, Freightliner Corporation.

Ether For Cats

Fast starts in below-freezing temperatures are routine with the improved direct electric starting systems just announced by Caterpillar Tractor Co. as attachments for No. 12, No. 112 and No. 212 Motor Graders and DW15, DW20 and DW21 wheel-type tractors. Each of the 24-volt systems now includes as standard equipment two ether starting aids and the necessary tubing to inject vaporized ether into the air intake manifold. The use of ether starting aids in conjunction with the glow plugs which have been successfully used in Caterpillar direct electric starting systems for some time makes it possible to start without difficulty in temperatures as low as 10° F. (ITS NEW)

New salmon troller operating in waters off Washington and Alaska this year is the 40-foot SEA-CREST owned by Hubert J. Koskey of Silverdale, Washington. The craft, designed and built by her owner, has a payload capacity of 15,000 pounds of iced fish. Power is supplied by a GM 4-51 Detroit diesel engine turning a 28" x 17" wheel through three to one reduction gears. Her top speed is nine knots and she trolls nicely at 600 engine rpm, according to her owner. Evans Engine and Equipment Company of Seattle supplied the power unit.

Huber-Warco Company of Marion, Ohio, is now announcing the addition of Cummins diesel units to its line of 6-D and 7-D series motor graders with torque converter and full power shift transmission. The new models are the 6-D2, powered by a 125-horsepower JN-6-BI Cummins, and the 7-D2, powered by a 150-horsepower JBIS-600 Cummins diesel. The 6-D2 and 7-D2 are similar in design to the 6-D and 7-D which carry GM diesels.

As the 6-D and 7-D, the 6-D2 and 7-D2 feature Huber-Warco's combination of a torque converter, and full power shift transmission which yields important advantages. These include more usable

The World's Leading Manufacturers of FUEL INJECTION EQUIPMENT for Diesel Engines

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Head Office: 653 Tenth Avenue, New York 36, New York
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AP 174-755

power, increased ease of operation and positive protection for all machinery. Also, the combination provides greater workload capacity and greater variations in torque output with only four forward and four reverse speeds. The power shift transmission, itself, permits quick shifts under full load at wide-open throttle without interrupting power flow from the engine to the load.

Also standard found on both grader models is a power sliding moldboard, operated hydraulically from the cab. It allows an operator to power-shift the moldboard out of the way as he approaches a culvert or post and then power-shift it back to its exact former position—all without leaving the cab or slowing his progress. Complete hydraulic control of every working position—entirely governed from the cab—is another important feature. The operator can attain a high bank-sloping angle up to 90 degrees on either side without leaving the cab. The blade can be rotated 180 degrees without removing the scarifier teeth.

The entire 6-D and 7-D series, including the new Cummins powered models, boast time and labor saving hydraulic booster steering that retains the positive feel of manual steering. Simplified to operate with a minimum of parts, Huber-Warco's hydraulic booster steering reverts automatically to manual operation in case of power or hydraulic failure.

Arkansas pumper—Owner H. T. Pannell, of Stephens, Ark., uses two International U-264 diesel units to operate oil well pump jacks on the Ballard leases near Norfett, Ark. The two units, one of which is pictured above, pump about 400 barrels a day from a depth of 2,500 ft, producing 20 barrels of oil. Pumper Johnnie Hollan says: "These Internationals are dependable; the kind of power you can start up and forget about."

OGP Division Event

It is anticipated that the 29th Annual Technical Sessions and Exhibits of the Oil and Gas Power Division of the American Society of Mechanical Engineers will draw the largest attendance to date.

The usual highly select attendance will include engine manufacturers' representatives, accessory manufacturers' representatives, military personnel, oil company representatives, municipal and utility plant operators, consulting engineers, educators and government agencies, among several others.

The event will be held at the Kentucky Hotel in Louisville, May 20-23. Ray Schakel is in charge of the fast going exhibit space. Those firms wishing to reserve any available space for an exhibit should contact him at Diamond Chain Company, 407 Kentucky Ave., Indianapolis, Indiana. Orders should be sent in with a minimum of delay. A number of papers have been received and panel discussions are being arranged. DIESEL PROGRESS will bring complete details on the various speakers, subjects and discussions as soon as it is made available to us for publication.

Inasmuch as both the Oil and Gas Power Division Convention and the REA Managers Meeting will take place during the early part of May, the May issue of DIESEL PROGRESS will be a convention issue. Full details of the REA award winning plants will be included as will facts and figures on the four runners up in each division. Advertising forms will close noon, April 10th. A great issue in which to sell your product or service. Don't miss it.

Keeping the stock of spare parts in condition today amounts to one and the same things as having your engine in good running order tomorrow.

EATON VALVES

are Backed by 35 Years of Diesel Engine Experience

Eaton Diesel Engine Valves are produced to meet the exacting requirements of Diesel engine service. Through more than 35 years of co-operating with the country's leading Diesel engine manufacturers, and furnishing valves to them, Eaton has developed a thorough understanding of the problems peculiar to the Diesel field. Eaton's experience is reflected in the outstanding performance records achieved by Eaton-made valves in all phases of Diesel engine service.

Eaton Diesel Valves are produced in a wide range of materials, and in both faced and unfaced designs.

Our engineers will welcome the opportunity to discuss the application of Eaton valves to your engines.

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PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springfites Spring Washers Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Northeast Diesel Notes

By Arnold B. Newell

THE JAKOBSON Shipyard at Oyster Bay, New York, has launched the *Diana Moran* and laid the keel for another of these $560,000 ultra modern tugs building for the Moran Towing & Transportation Company of New York City. They are all welded steel boats 106 ft long powered by 16-cylinder General Motors diesels rated 1750 hp each.

THE STATE of New York Power Authority has purchased a Model 8X Superior diesel driving a 500 kw Ideal Electric Co. generator to be used as temporary and stand-by power for the gates in the Messina dam on the St. Lawrence Seaway project. Sale was made by the New York branch of the White Motor Company's diesel engine division at 115 Broad St.

AT THE Springfield plant of the White Motor Company a Model 40-S8 diesel is being set up to drive at 720 rpm a General Electric generator as a package on a steel sub base for stand-by service in the Michigan Bell Telephone Company system. Sale was made by the Springfield Regional Office of White.

THE FREDERICKTOWN Supply Company of Fredericktown, Ohio, reports good volume of sales of John Deere diesel tractors to the larger farms in the Fredericktown area.

SOME OF the more interesting applications of Hercules diesels are reported to be the "DEW" Line (Distant Early Warnings) chain of radar stations using completely automatic units with a system worked out by Western Electric engineers and Bell Laboratories. Particulars are not currently available.

ANOTHER interesting chain of Hercules power units is to be found in the micro wave television stations stretched across the nation in areas where high line power is not available.

A SUPERIOR S-6 driving a General Electric generator in package form with heat exchanger cooling has been purchased from the White Diesel Engine Division of the White Motor Company by the Korean Reconstruction Agency. The sale was made by the Export Office of White in New York City.

ANOTHER KOREAN order obtained by the same office is for a 300 kw generator driven by a Superior diesel Model 40 S-8 on steel sub base with radiator cooling. The McGraw Hydrocarbon Company is the purchaser.

CAPTAIN Paul Hammond, USNR (Ret) has purchased two Mercedez-Benz diesels of 120 hp each for installation in the Thames River Barge he is having built. This vessel's construction was reported previously in these columns. The engines, now available in this country, are 4-cycle, 6-cylinder units operating at 1800 rpm and equipped with a new type of electro-magnetic reverse and eduction gearing.

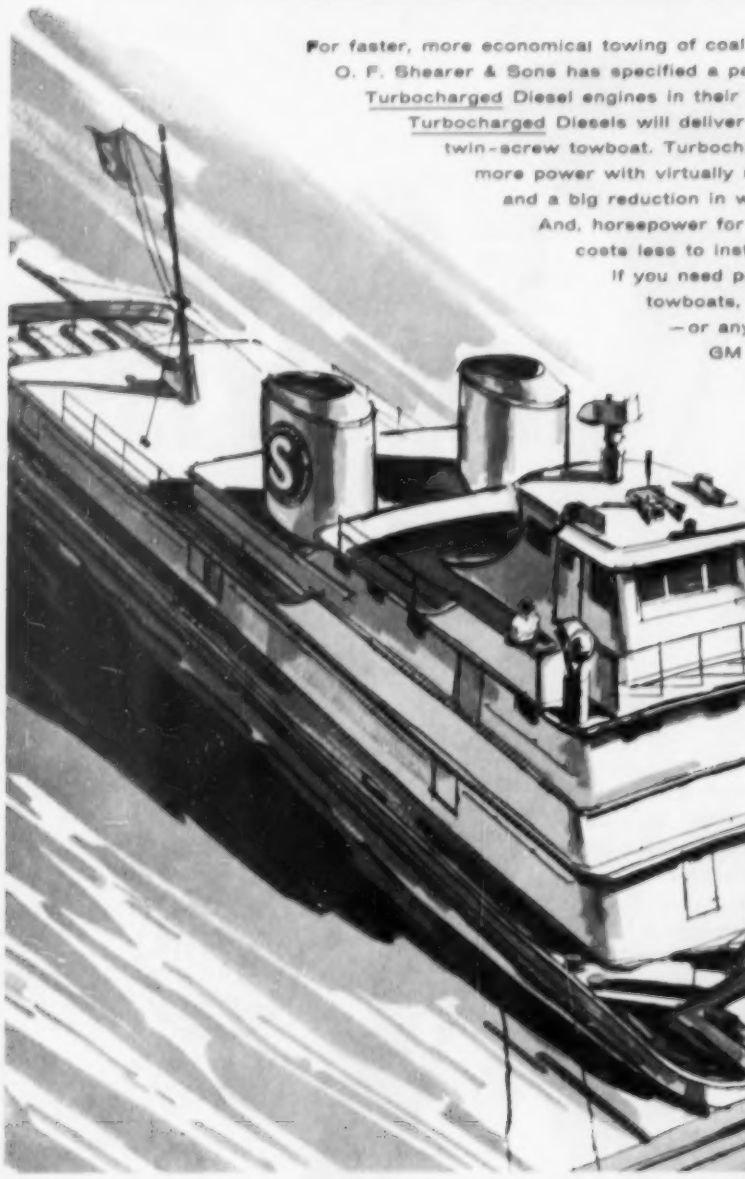
J. SEWARD Johnson of New Brunswick, N. J. is having a new yacht built to be powered by twin-screw Mercedez-Benz diesels rated 94 hp each. This is a compact engine only 54 inches long including gear box.

THE TEXAS Company, Claymont, Delaware recently purchased a 110 hp Cummins diesel to drive a petroleum transfer pump. Cummins Diesel Engines, Inc. of Philadelphia sold the engine.

A MODEL 352 Marion shovel will be equipped with new 165 hp Cummins diesel sold by Cummins Diesel Sales

O. F. SHEARER & SONS PICKS

GM TURBOCHARGED DIESEL POWER



For faster, more economical towing of coal barges on the Ohio River, O. F. Shearer & Sons has specified a pair of General Motors Turbocharged Diesel engines in their newest towboat. Compact GM Turbocharged Diesels will deliver 2700 horsepower for the new twin-screw towboat. Turbocharging gives a GM Diesel 75% more power with virtually no increase in engine size and a big reduction in weight per horsepower.

And, horsepower for horsepower, a GM Turbocharged Diesel costs less to install, operate and maintain.

If you need power for tugs, tankers, towboats, dredges, cargo ships —or any other application—specifying a GM Turbocharged Diesel can give you a far greater return on your investment.

See your local Cleveland Diesel Engine Division Representative for full details or write direct.

Designed and being built by the Hillman Barge & Construction Co., Pittsburgh, Pa.

CLEVELAND DIESEL

An Engine Division of General Motors • Cleveland 11, Ohio

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Portland, Ore., 3676 S. E. Martins St. Tel.: Prospect 1-7509

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San Diego, Calif., 3886 Sequoia Street Tel.: Broadway 3-1752

San Francisco, Calif., 870 Harrison St. Tel.: Douglas 2-1931

Seattle, Wash., 1230 Westlake Ave. N. Tel.: Adler 1440

Wilmington, Calif., 433 Marine Avenue. Tel.: Terminal 4-4098

GM CLEVELAND DIESEL

Corp., Bronx, N.Y. to Queens Structure Corp. of Woodside, Long Island, N.Y.

SARAFINI Construction Company, prominent general contractors of Binghamton, New York has purchased a 110 hp Cummins diesel from Cummins Diesel Central New York, Inc. for installation in a Lima model 34 Paymaster shovel.

A MODEL 55M2 Federal Tractor owned by F. P. Olden of Chestertown, New York has been equipped with a new 175 hp Cummins diesel delivered by Cummins Diesel Sales Corp. of Albany, N.Y.

THE LESTER C. Newton Trucking Company of Bridgeville, Delaware have installed a 175 hp Cummins Turbodiesel in a Mack B60T tractor. The Baltimore branch of Cummins Diesel Engines Inc. Philadelphia made the sale of the engine.

A MILITARY hospital in Peru has purchased a 210 kw generator driven by a Superior 40 S-8 diesel operating at 900 rpm. This installation employs an interesting piping arrangement as the plant will be located in a small compartment 20 ft below ground, under the hospital. The White Export Office negotiated the sale.

TWO ADDITIONAL Superior diesels have been shipped to Texas Tower No. 2 off Cape Cod. These are model 40 SX-6 rated 360 hp at 720 rpm and driving 250 kw Ideal generators.

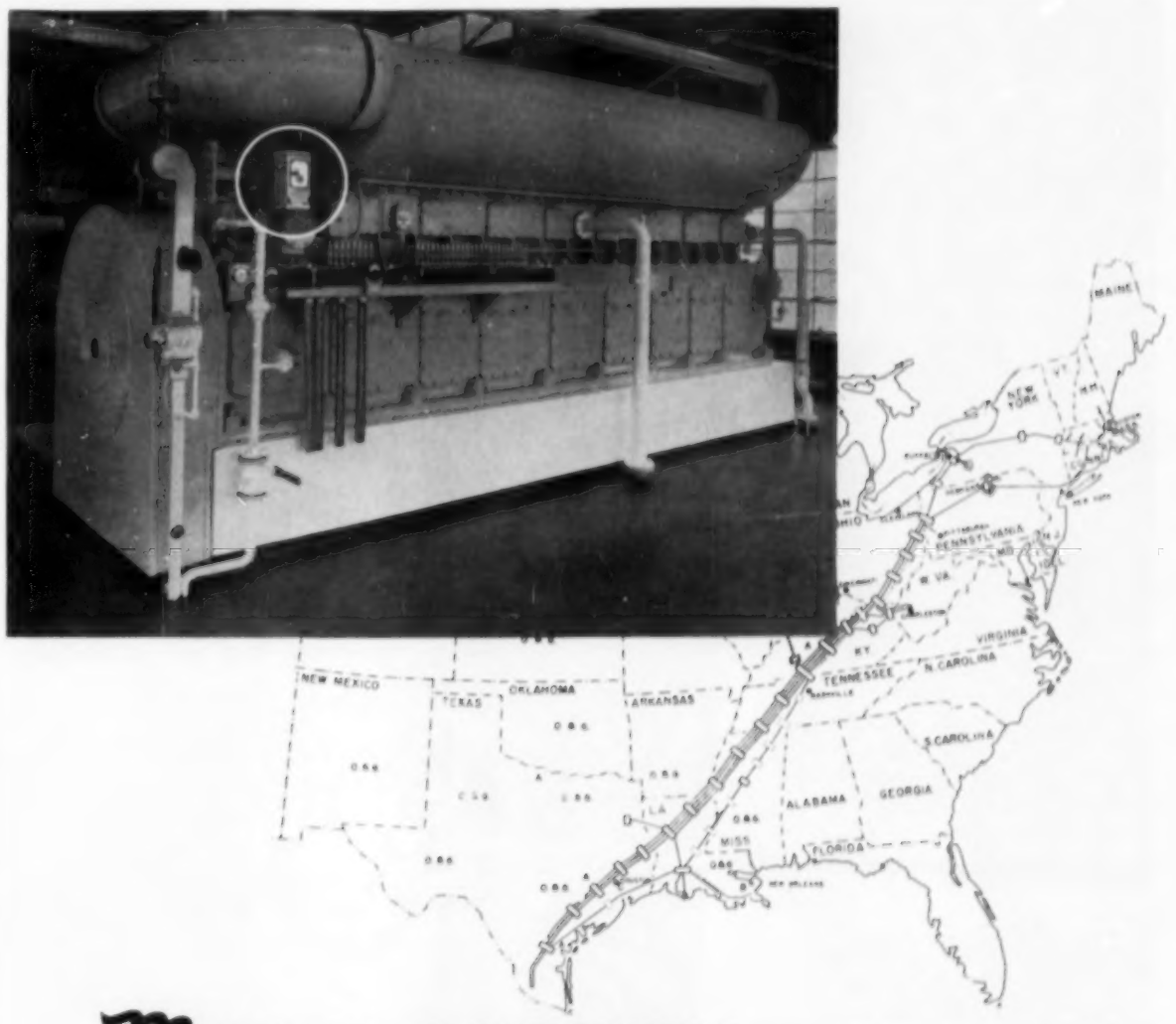
AN ATLAS IMPERIAL Model 35-S-6 marine engine equipped with Snow-Nabstedt reverse and reduction gears and Fawick power take-off has been sold by the Diesel Engine Division of White Motor Company for installation in a 65 ft dragger operating out of Lunenberg, N. S. The owners are Atlas Shareholders, Ltd. so named because they had obtained excellent service out of another Atlas purchased 18 months earlier. The new engine delivers 195 hp at 1225 rpm.

Manufacturer's Agent

Alco Products, Inc. and the Power Machine . Company of Tulsa and Kansas City jointly announced recently the appointment of Power Machinery as exclusive manufacturer's agent in Oklahoma and Kansas for Alco oil field equipment. The announcement was made in a statement by E. N. Sieder, ALCO's marketing manager for oil field equipment, and H. C. Wieghard, president of Power Machinery. Power Machinery Company last year was appointed by Alco exclusive agent in Kansas, Oklahoma, Texas and Louisiana for the Alcotwin line of fin-tube heat exchangers.

Under the new agreement, Power Machinery will handle the complete line of Alco oil field equipment built at the latter firm's Beaumont, Texas plant—the former Beaumont Iron Works. The Alco product line at Beaumont includes manufacturing and expanded warehouse facilities for drilling and production equipment. Alcotwin heat exchangers, flanges and other rolled-steel products. Also handled from Beaumont are Alco's new diesel-electric drilling rig power package and pipeline-pumping and auxiliary diesel engines. Alco is engaged in a $1-1/2 million expansion program at its Beaumont plant. The construction, which will be completed in the near future, includes a combination warehouse-office building together with an expansion of manufacturing facilities.

Next time you connect the circulating pump to the sea cock with a piece of hose be sure it is Suction hose, that is unless you like to scare hell out of yourself with a hot engine due to collapsed hose and water estopped!



Massey GOVERNORS provide dependable power regulation in gas pipeline compressor service

The photo shows a Massey Governor on a Clark TRA-8, rated at 1,450 BHP, installed at Tennessee Gas Transmission Company's pipeline station at Middleton, Tennessee.

There are four pipelines into and out of this station on the company's main multiple-line system, which begins in the Rio Grande Valley and extends 2,200 miles northeast into New England. The 23 compressor engines, with a total of 31,240 horsepower, require precise and unfailing regulation for maximum efficiency.

Curtiss-Wright Massey and Marquette Governors are daily proving their dependability in thousands of installations—on land and sea. Our engineering facilities are at your disposal for solving all problems of power control.

Massey GOVERNORS | Marquette GOVERNORS

MARQUETTE METAL PRODUCTS DIVISION
CURTISS-WRIGHT
CORPORATION • CLEVELAND 13, OHIO

Other Marquette Products: AIRCRAFT WINDSHIELD WIPERS • ANTI-FRICTION BEARING TEXTILE SPINDLES • SPRING CLUTCHES PRECISION PARTS AND ASSEMBLIES • ROTARY OIL PUMPS

Florida Diesel News

By **Ed Dennis**

THE FIRST pair of turbocharged Detroit Diesel engines in South Florida will be installed in the 64 ft "Janice" of Ft. Lauderdale. Developing 271 hp at 2300 rpm with G.M. 2½ to 1 hydraulic r&r gears the installation will be made by Ellis Diesel Sales & Service of Ft. Lauderdale. Owned by J. E. Anderson Construction Co. of Chicago.

AT HOMESTEAD, contracts totaling $893,769 were awarded by the City Council for expansion of the Homestead Municipal Light & Power Plant. Awarded contracts were Graybar Electric Co. Inc. and Fairbanks-Morse & Co.

THE SAMPLE Rock Co. at Pompano Beach took delivery of a TD 14 International with a drop loader and down at Key Lago, Alonzo Cathron received a TD 24 International dozer. Both from Florida Georgia Tractor Co. of Miami.

TWO J. N. 6-B. I. Cummins diesels, one in a Galion road grader for R. H. Wright & Sons, Ft Lauderdale, and one for the Adams grader that went to the State Road Department.

TWO G.M. 6-71 diesels supply power for each of the 3 new model S-18 Euclid scrapers received by W. T. Price & Bylth Bros.

J. FRANK KNORR Co., Miami, repowered the charter fishing boat "Reef Corsair" of Islamorada with two model 6-D. A M R 273 Buda diesels rated 85 hp at 2800 rpm with Snow-Nabstedt 2.5:1 r&r. Capt. Hugh Brown of Whale Harbor reports better fuel consumption and 2 knots more than with the old 130 hp gasoline engines.

THE "JUNGLE QUEEN", a sightseeing vessel skippered by Al Start of Ft. Lauderdale, received a model N H M-604 Cummins diesel with a Twin-Disc #511 4.4:1 hydraulic gears. Also a 3 kw Onan diesel auxiliary light plant.

DIESEL ENGINE Sales of St. Augustine recently launched the "Miss Phyllis" for Charles Ludwig of Miami, the "Sand Dollar" for John Raulerson of St. Simons Island, Ga. and a 67 footer for Sohlman Seafoods of Tampa. All have Caterpillar D342 diesels which came from the Gibbs Corp. at Jacksonville, Florida.

90 MILES FROM Port-au Prince, Haiti in the Artibonite Valley, William Larimer Mellon, of the Pittsburgh Mellons, founded the Albert Schweitzer Hospital. It has 50 beds, 3 air conditioned operating rooms plus living quarters and a modern power plant which consists of 3 D13000 Caterpillar diesels with 85 kw General Electric generators.

JACK AUGUST Gradall Rentals, received a Gradall #2460 powered with a GM 3-71 mounted on an International truck. A General Motors power take-off is used for the Commercial hydraulic pump which works the Gradall; to be used for ditching.

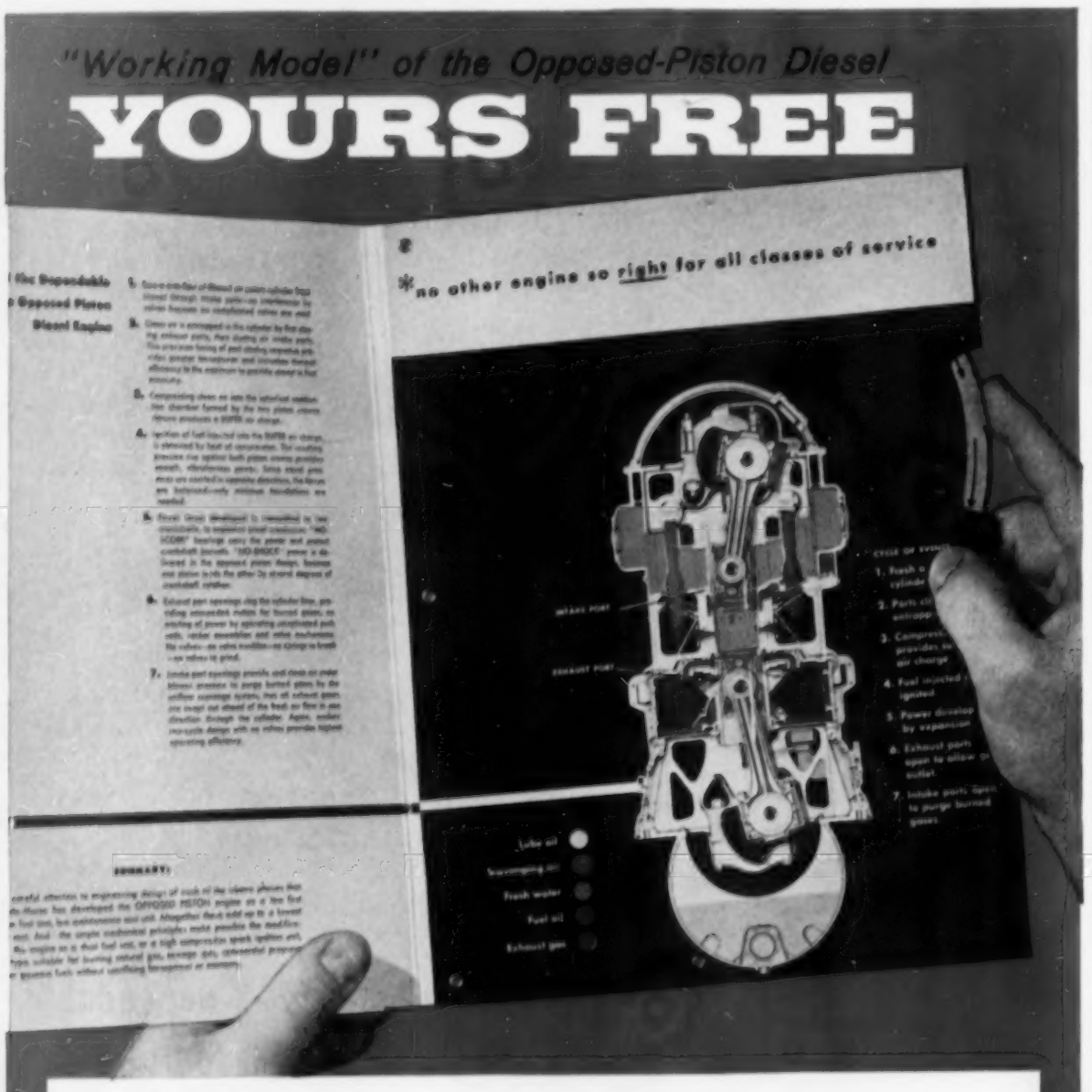
ELLIS DIESEL Sales & Service of Ft. Lauderdale has just put into service a 30 ft steel vessel which along with their airplane and service trucks will give the General Motors diesel owners of Broward County full coverage for parts and service.

T. M. T. TRAILER Ferry Inc. will take delivery of the new tug being built at Dade Drydock Corp. powered with a DMG 36 Enterprise diesel rated 643 hp at 400 rpm.

AT MAYPORT, L. R. Salis has just completed a 36x11 coastal shrimp trawler. Building the "St. Nick" took a year of his spare time from commercial fishing. It is powered with a D315 Cater-

"Working Model" of the Opposed-Piston Diesel

YOURS FREE



Here in Graphic Full Color

is a detailed working model of the Fairbanks-Morse Opposed-Piston Diesel Engine—and it's yours free for the asking.

With the 8-inch operating cutaway in front of you, you can follow the complete operating cycle of this outstandingly successful heavy-duty engine designed for continuous service. Moving the disc at the right operates the model showing exact position of pistons, and color codes condition in the cylinder, throughout the entire cycle of events.

You'll also see the simplicity of the O-P that has no valves, intricate valve trains, cylinder heads and gaskets—in fact, it has 40% fewer moving—wearing—parts than any comparable engine of equal horsepower.

If you are interested in dependable power with low operating and maintenance cost, send for your working model of the O-P diesel today! Simply attach this advertisement to your letterhead (or ask for O-P "Working Model") and send to Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES
RAIL CARS • ELECTRICAL MACHINERY • PUMPS • SCALES
HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

pillar developing 58 hp which was supplied by the Gibbs Corp.

RECENT General Motors diesel marine installations included a 4-71 in the "Chopper" of Ft. Lauderdale; two 300 hp 6-110's in the freighter "Le Francais" and a 6-71 with Allison 4.5:1 R&R gears for the "Tom and Jerry" of Panama City.

A 6 CYL. ENTERPRISE diesel with a 375 kva Marathon generator is the latest addition to the Compagnie D'Eclairage Electrique at Cap-Haitian, Haiti. They also have two 4 cyl. 250 kva Fairbanks-Morse generating units with Woodward governors.

VOLUSIA COUNTY Commissioners took delivery of a #2 Galion road grader with a JN6B Cummins diesel and Manley Construction Co. received 4 International graders with model HRBI Cummins diesel engines.

FOR THE WEST Indies, two D8 Caterpillar tractors to R. J. M. Co. of Kingston, Jamaica and for St. Marc, Haiti a Dart 6 wheel dump truck with a Cummins diesel and two D6's, four D4's, four#2 scrapers and a 933 traxcavator-all Caterpillar.

THE ALEXANDER Orr Jr. water treatment plant in Miami will receive an SW6 Worthington diesel installed March 1957. The Worthington pump will deliver 30,000,000 gpd. The engine is rated 1500 hp at 450 rpm.

Field Engineer

A widely experienced sales engineer from San Francisco has been named Field Engineer in the Northwest Section of the United States by The Weatherhead Company's Fort Wayne Division. Edward R. Bate (4333 Irving Street), San Francisco, California, was named to the position by John Allen, Sales Manager of the Industrial Distributor Division which Bate will represent in an area that includes Oregon, Idaho, Wyoming, Montana, Washington, Colorado, Utah, northern Nevada, northern California and the northwest portion of Nebraska.

Prior to joining The Weatherhead Company, Bate was employed as sales engineer by the H. R. Basford Company and the Cratex Manufacturing Company, both of San Francisco. With the latter Bate served as sales manager.

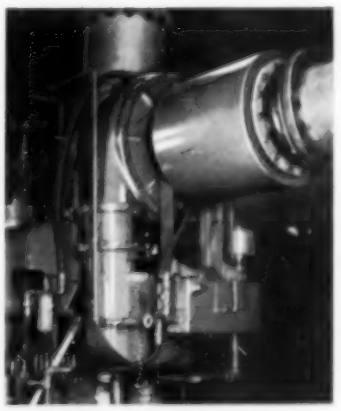
Bate's educational background includes attendance at Colorado Military School Junior College; Denver University; Colorado A&M; and Adams State College. He also served two years in the Air Force. In commenting on his appointment, Allen said, "I'm pleased to have a man of Ed Bate's experience in the Industrial Distributor Division."

New Landing Craft Design

With the design phase rapidly nearing completion, National Steel and Shipbuilding Corp. of San Diego has started construction of their new 338 ft Beach Discharge Lighter. Built for the Army Transportation Corps under contract from the Bureau of Ships this vessel incorporates numerous novel design features. Main propulsion will be supplied by two Fairbanks-Morse model 38 D 8 6 cylinder diesel engines developing 1200 hp to twin vertical axis propellers. Conventional rudders and steering gear have been replaced by Pneudyne positioners controlling the attack angle of the propeller blades. The bow ramp contains a powerful hydraulic ram enabling the craft to literally tear itself free from the shore. When used in conjunction with the versatile Voight-Schneider propulsion units and the extensive ballast system this ram virtually eliminates the stranding difficulties inherent in earlier landing craft.

The Ford City, Pa. plant. Shown at lower right is the latest engine with Elliott 1245-kw generator. At upper left, Elliott 1085-kw generator installed in 1948. At the rear is the Elliott 300-kw generator installed in 1936.

ELLIOTT Generators and Turbochargers

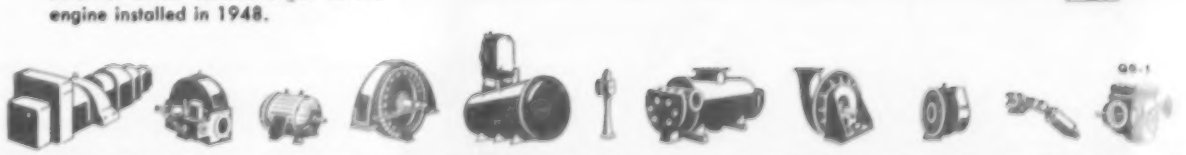


Close-up of the Elliott turbocharger serving the engine installed in 1954. Another Elliott turbocharger serves engine installed in 1948.

Twenty years ago, the Ford City, Pa. municipal plant installed its first diesel generating unit and an Elliott 300-kw generator went on the job. Since then additional units have been added three times—1941, 1948 and 1954. Each time Elliott generators got the call and in 1948 and 1954, Elliott turbochargers were also included. It's another case of steady, trouble-free performance for Elliott generators and turbochargers. It pays to specify them everytime.

For complete information, consult your local Elliott Field Engineer or write Elliott Company, Jeannette, Pa.

ELLIOTT Company



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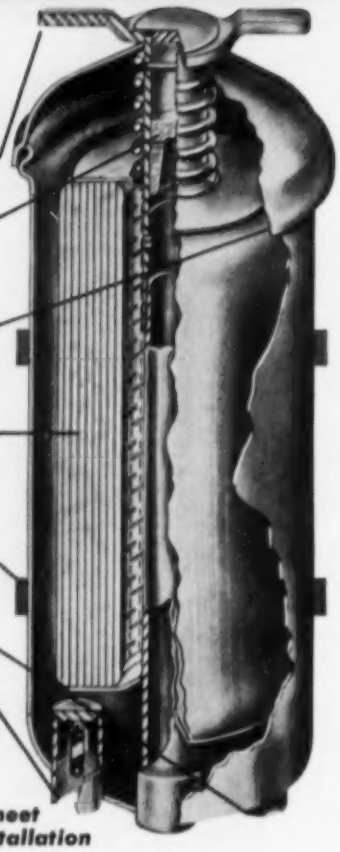
Guarantee THE ULTIMATE IN OIL CONDITIONING!

Check THESE ENGINEERING FEATURES:

- Hand control for quick servicing. No wrenches required.
- Exclusive dual purpose by-pass design insures full oil pressure for maximum engine protection and longer element life.
- Functional "O" ring seal—The greater the pressure, the greater the seal. Eliminates constant gasket replacement.
- Elements are designed to give a maximum of filtration, accomplished by the use of perfected filtering media in relation to service requirements.
- Sturdy clamp-type mounting for safe installation under all conditions.
- Drain is located at the bottom of oil sump.
- Inlet at bottom for ease and safety of installation. Inlet check valve prevents drainback and undesirable turbulence.



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Oil conditioning and full flow protection to all precision working parts of the engine are incorporated in the same unit. Cases are designed so that new elements may be replaced in a matter of moments.

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ENGINE LIFE PRODUCTS CORPORATION

EL MONTE, CALIFORNIA

ENGINEERED FILTRATION SERVICE

INDUSTRIAL AUTOMOTIVE MARINE & AGRICULTURAL

Michigan–Ohio News

By Jim Brown

SIX NEW 9000 TD White trucks, with JT6 175 hp Cummins engines were purchased this summer from the White Motor Co. of Detroit. Between Atchison, Chicago and Detroit, these trucks are averaging 5,000 miles a week for the Red Star Transit Company.

THE FISHER Sand & Gravel Company of Midland, Michigan has taken delivery of a Koehring Model 405 1 yard excavator with a 4-71, 4055-C GM Detroit Diesel from Earle Equipment Company of Detroit, Michigan. Peninsular Diesel Inc. of Detroit will service the engine.

THE HOLMES Construction Co. of Lorain, Ohio is breaking in a new L-25 Thew Shovel with a 3-71 (3055-C) GM Detroit Diesel engine. The shovel was purchased from Atlas Equipment Corp., and will be serviced by the Great Lakes Diesel Co. of Cleveland, Ohio.

A BAY CITY 45 Crane with a "Cat" D-318 engine has been purchased and delivered from the R. G. Moeller Co. of Detroit to C. J. Rogers Co., a twenty-five year customer of diesel engines from Flint, Michigan.

THE R. G. MOELLER Co. of Detroit has just delivered a model 3000 Manitowoc crane with an HBI Cummins diesel engine to the Detroit Edison Company. This crane will be added to a fleet of six others and used for steel erection jobs in this area.

ED LEVY Construction Co. of Detroit is now using an Allis-Chalmers HD-21 bulldozer on slag piles. This unit was sold by the Earle Equipment Co. of Detroit.

OAK CONSTRUCTION Company of Royal Oak, Michigan has a new LeTourneau-Westinghouse Model D Tournapull which is being put into operation on street excavation projects in Inkster, Mich. This Tournapull, sold by Telford Equipment Co. of Detroit, has a GM 4-71 diesel engine and a 7 yard bucket.

NOT ONE BUT *two* LeTourneau-Westinghouse Model B Tournapulls have been recently delivered to Holloway Construction Co. of Livonia, Michigan. Powered by Cummins NHRBIS-600 engines, they are working on a highway re-location project at Charlotte, Michigan.

THE HOLLAND Michigan Iron and Metal Company owned by Louis Padnor has had a second Michigan TMDT-16 Magnet Crane repowered by Peninsular Diesel of Detroit with a model 3057C GM Detroit Diesel. Peninsular Diesel furnishes a magnetchargine generator drive directly off the engine for this type of crane.

MR. LEO POMA of Inkster, Michigan has been delivered an International Harvester TD-6 equipped with a hydraulic bulldozer. The unit was purchased from Wolverine Tractor and Equipment Co. of Detroit.

THE BLUE WATER Transit Co. located at Port Huron, Michigan has recently received an I.H. TD-9 crawler with hydraulic bulldozer from the Wolverine Tractor & Equipment Company of Detroit.

A REBUILT 4057-C GM (Detroit) diesel has been purchased by Lyons Construction Co. of Whitehall, Michigan from Peninsular Diesel of Detroit to power a Murray and Tregurtha Harbormaster outboard propulsion unit which was formerly gasoline-engine powered.

A. F. POSENIK and Michigan Transportation Co. of Detroit have taken delivery on *twenty* WC24 TD White trucks from the White Motor Company, also of Detroit. Transporting bulk cement and fuel oils, the new Whites are powered by a Cummins diesel rated at 200 hp.

IN PONTIAC, Michigan S. D. Soloman and Sons have accepted delivery on a D-9 Caterpillar tractor sold to them by Michigan Tractor & Machinery Company of Detroit.

A NEW GALION T-500 Grad-O-Matic with a 125 hp Cummins diesel engine (model JN6B1) is being broken in by the Sanilac County Road Commission of Sandusky, Michigan.

FOR EXCAVATION work on houses, Mr. Harry Richmond of E. Detroit has a new Bucyrus-Erie 22-B drag shovel with an International Harvester UD-525 diesel engine. This unit was purchased from the Detroit branch of Wolverine Tractor & Equipment Company.

RECENTLY DELIVERED by the White Motor Company of Detroit are four DC7564 Autocars (180 hp Cummins diesel engines) which will be used by the N. A. Albers Co. for supplying gravel and construction materials to various contractors in and around Detroit. This purchase will bring their fleet of Autocars up to forty—all powered by Cummins diesels.

IN TOLEDO, Ohio Walter D. Giertsen recently purchased a Jaeger 600 cfm air compressor from George T. Ryan Company, Great Lakes Diesel of Cleve-

land will service the 6-71 GM Detroit Diesel engine.

FARMERS CHEMICAL Company of Kalamazoo, Michigan has installed two specially fabricated 75 kw 1200 rpm generator sets powered by GM Detroit diesel and furnished by Peninsular Diesel of Detroit. The generators are set up to work in series or in parallel as required.

THE MOLE Construction Co. of River Rouge, Mich. has accepted delivery on an I.H. TD-9 tractor from the Wolverine Tractor and Equipment Co., which will be used on heavy excavation and pipeline work.

A NEW CEDAR Rapids Junior Tandem Portable Gravel Plant with a Caterpillar D-337FX diesel engine has been delivered to Mr. George Miller Jr. of Benton Harbor, Michigan. The sale was made by Michigan Tractor & Machinery Company of Detroit.

WORKING ON US 27, north of St. John, Michigan the Holloway Construction Company of Livonia, Michigan is employing 2 twenty-eight ton D-9 Caterpillar tractors, both from Michigan Tractor & Machinery Company of Detroit.

BERRIAN COUNTY Road Commission is now using a new I.H. TD-18 equipped with a cable bull-grader and P-25 winch for general county work.

ANOTHER I.H. TD-18 with a hydraulic bulldozer has been purchased by Mr. L. F. Carlton of Ann Arbor, Michigan from the Wolverine Tractor & Equipment Co. of Detroit.

A GARDNER-DENVER Air Compressor with a 4-71, 4031-C GM Detroit Diesel was delivered this spring to the Somerville Construction Company located at Ada, Michigan.

Expanded Vehicle Line

Reo Motors Inc., made public recently the fact that it had expanded its line of heavy-duty vehicles by 30 new basic models within the past year, including a line of turbodiesels, eight off-highway trucks, cab-over-engine tractors and several lightweight tandems. It is the widest product expansion program undertaken at Reo in more than twenty years, John C. Tooker, president, said. What this amounts to, he added, is that with axle and transmission options available on these new basic trucks, the model line actually is expanded by more than 100 vehicles. The program was developed, Tooker said, to produce Reo trucks for every type of truck operation, on or off the highway.

The final step in this program will be the addition of the 200 hp, 250 hp and 300 hp diesels and the first of these will be in the process of building within the next few months. The Reo development program, Tooker pointed out, embraced many things beyond the expansion of its line. A complete re-organization of its field sales organization, construction and purchase of new branches, re-location of several others and radical changes in its manufacturing process have been but a few of the main activities undertaken since the company was purchased by Bohn Aluminum & Brass Corp., in the closing days of 1954.

"The engineering problems involved," Tooker said, "have been tremendous but we are well on the way to accomplishing our ultimate purpose, despite the handicaps that always beset a company undertaking rapid expansion. We feel that no company in our industry has succeeded in achieving so much in such a short time and we are very proud of the record we have made since the beginning of 1955. We now have 50 basic truck models in the Reo line and there are more to come when we have completed the engineering on the heavy-duty diesel line. This will put Reo in a position to compete with other companies in our industry which have had this field pretty much to themselves: More important, of course, is that we are ready to participate in the booming truck market which is developing as the result of the Federal Highway program which very likely will be signed into law by President Eisenhower before July 1. As for the year ahead we have many new plans that will complement those we have already completed. All in all the past 12 months period has been a very significant one for our company."

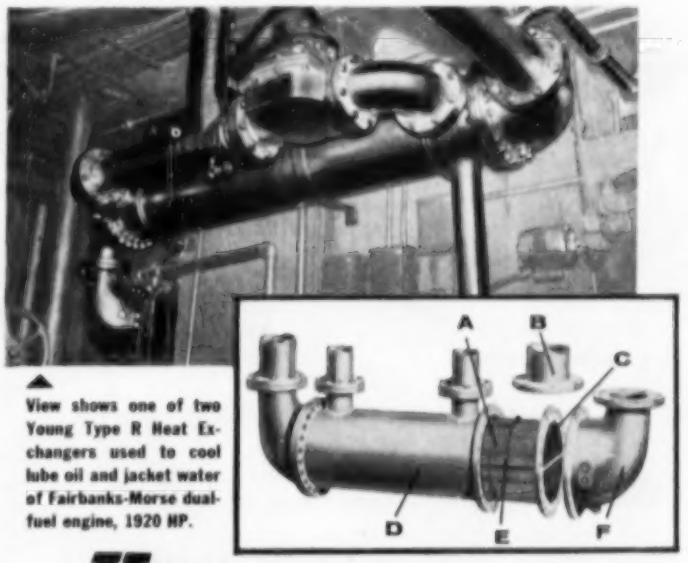
New Literature

Heavy-duty, single-stage hydraulic torque converters for transmission of 100 to 1000 horsepower to excavating, earth-handling, and construction machinery are described in Bulletin No. 468 newly issued by The National Supply Company, Pittsburgh. The bulletin gives features and specifications of 17 sizes and capacities of National Torque Converters for exact matching with engines in this power range. For Further information write to National Supply Co., Industrial Products Division, 2 Gateway Center, Pittsburgh, Pa.

No bargain in power has ever been obtained by overloading an engine. However there is no escaping the fact every operator thinks in terms of doing a job with the power at hand overload or none.

Young Products on Duty

Where Economy and Efficiency are Absolutely Essential!



▲ View shows one of two Young Type R Heat Exchangers used to cool lube oil and jacket water of Fairbanks-Morse dual-fuel engine, 1920 HP.

Young Heat Exchangers Cool Municipal Power Engines

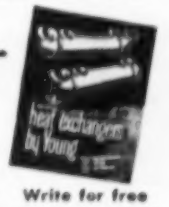
There is an extra measure of responsibility which falls on equipment supplying the power and light for an entire community. That is why all component parts of this equipment must be designed, engineered and manufactured by top specialists in their field. With this in mind, Corning, Iowa, officials specified Young Heat Exchangers for its municipal power plant engines. Young Heat Exchangers have a far-reaching reputation for dependability, compactness, low first cost and economical operation.

Cut-away view above points to good reasons for specifying Young Type R Heat Exchangers . . .

A—removable tube bundle permits outside and inside of tubes to be readily inspected and maintained. **B**—piping remains undisturbed while removing bonnet and bundle. **C**—tubes rolled into header and mechanically expanded to form sturdy, reliable joint. **D**—bundle made of non-ferrous materials for fresh or salt water installations. **E**—baffle spacing engineered to provide proper turbulence of fluid for maximum heat transfer. **F**—for horizontal mounting; flat end plate for vertical mounting also available.

Put Young Talent to work for you . . .

Solving heat transfer problems is what we do best because it is our very reason for being. You, too, can harness the power of Young engineering talent. Write, wire or call without obligation.



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Heat Transfer Products for Automotive, Aviation and Industrial Applications. Heating, Cooling, Air Conditioning Products for Home and Industry.
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Midwest Diesel News

By **L. H. Houck**

PILOT FREIGHT CARRIERS, Winston-Salem, N. C., has bought 100 Diamond T tilt-cab, 723CJT tractors powered with Cummins JT-6-B diesels. About 85 of the new units are now in service in the eastern states. Other equipment on the tractors include Fuller R-46 Roadranger transmissions, Timken FE 900 front axle, Westinghouse air brakes, Solex safety glass, Ross TE-71 steering gear and Eaton 1911 5.43 ratio rear axles.

CLARK BROS., Van Buren, Mo., have placed a 110 hp Model HR-400 Cummins diesel in operation in their sawmill. Sale was made by Cummins Missouri Diesel Sales Corp., St. Louis.

GRAY RIDGE Special Road District has taken delivery on an Allis-Chalmers AD-45 motor grader from Ryan Equipment Co., Sikeston, Mo.

MERCHANTS MOTOR FREIGHT, Inc., with headquarters in Minneapolis, has added 117 Kenworth cab-beside-engine, No. 522 tractors, with Cummins Jt-6-B turbodiesels rated at 180 hp. Chassis weight is 10,990 lbs and capacity is 71,000 lbs gross combination rating.

TWO INTERESTING deepwell turbine applications have been powered with a 200 hp NHI-600 Cummins diesel and a 165 hp HRP-600 Cummins by Charles Taylor, Tremonton, Utah. Cummins Intermountain Diesel Sales, Salt Lake, made the sale.

AN ALLIS-CHALMERS HD-11-B has been delivered to Ralph Hazelbaker, at Southwest City, Mo., for custom work by Chiles Tractor and Machinery Co., Springfield.

MID-AMERICAN TRUCK LINES, Inc., Kansas City, Mo. have placed 15 Hendrickson tractors powered with Cummins Jt-6-B diesels. Hendrickson Mfg. Co., Lyon, Ill., specializes in the manufacture of over-the-road tractors and trailers. These tractors have Fuller transmissions.

HELTZEL CARTAGE CO., Kansas City, Mo., have placed several new GMC tractors in service with 6-71 GMC diesels. The company is a common carrier with routes to the eastern states.

CARTHAGE MARBLE CO., Carthage, Mo. which operates one of the largest marble quarries in the world, and owns a large fleet of diesel equipment, recently added an Allis-Chalmers HD-11-B tractor to its equipment. Chiles, Springfield, Mo., made the sale.

WATSON BROS., operating common carrier lines from coast to coast and with headquarters in Omaha, Neb., is running a number of Mack diesel tractors on US 40 from Denver east.

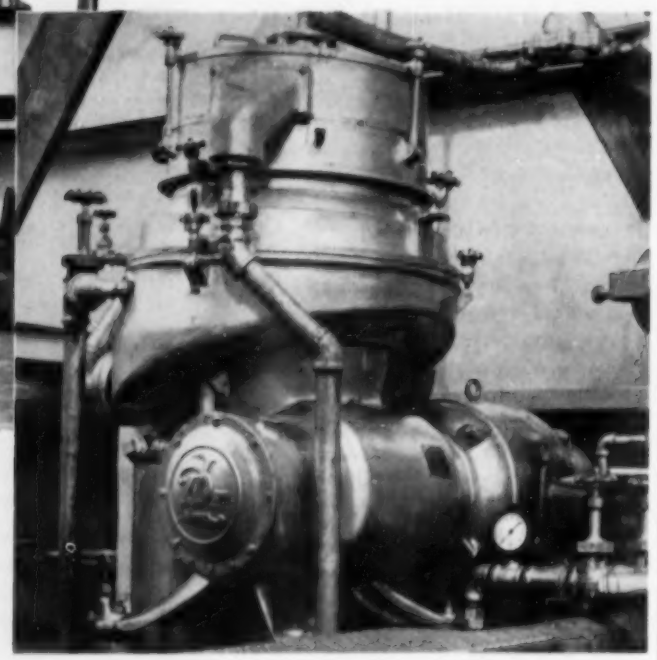
CONTRACT STEEL CARRIERS, Kansas City, Mo., who deliver structural steel and similar cargoes throughout the Middle West with tractor-trailer combinations, are now using a number of GMC tractors with 6-71 GM diesels.

A McCARTHY ROCK boring machine has been converted to diesel operation with a 180 hp HRFIP-600 Cummins by the Hummingbird Coal Corporation, Manchester, Ky. Cummins Diesel Sales of Louisville, Inc., made the sale.

C. F. SAAK Oil Co., Montgomery City, Mo., has added a GMC diesel tractor to its tanker fleet, powered with a 6-71 GMC diesel. The line hauls from the Phillips Oil Co., pipe line terminus at Jefferson City, Mo.

FROZEN FOOD EXPRESS, headquarters at Dallas, with lines running through

THE HEART OF THE TOWBOAT "MISSOURI" IS DE LAVAL



* The "Missouri" newest towboat in the Federal Barge Lines Fleet (above) and its essential De Laval Nozzle-Matic Heavy Fuel Oil Centrifuge, designed to economically clean residual fuel before it is burned.

Burning Bunker C fuel at full throttle in its 3600 H.P. diesels drastically reduces operating costs of the new towboat "Missouri."

The essential element — the real "heart" of the "Missouri" fuel system is its De Laval Nozzle-Matic Heavy Fuel Oil Centrifuge. Purifying up to 600 GPH of No. 6 residual fuel oil — continuously discharging undesirable sludge — the De Laval Centrifuge promises to reduce fuel operating costs approximately 25 per cent.

Such significant economies through De Laval are of prime importance not only to towboat operators, but to all other users of heavy fuel oil as well.

Get all the facts . . . write today.

* *Designed and built by St. Louis Shipbuilding and Steel Co.*

DE LAVAL SEPARATOR COMPANY

THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 201 E. Millbrae Ave., Millbrae, Calif.

the Middle West, is using a number of Cummins-powered Kenworth tractors on the fast frozen food run.

CLOUD OAK FLOORING Co., of Springfield and West Plains, Mo., which manufactures oak flooring and delivers to dealers and job sites over a wide radius, is using a tractor-trailer combination with a GMC tractor and 6-71 diesel.

INDIANAPOLIS-KANSAS CITY Motor Express Co., Kansas City, Mo., which recently changed to all diesel operation with 16 dieselized units which include 10 White 9000's with Cummins diesels and six repowering jobs with Cummins diesels, have moved their general office to 3537 Broadway, Kansas City.

TOM HUSTON PEANUT CO., Columbus, Ga., famous for its "Tom's Peanuts" trucks all over the country, has placed a Mack diesel tractor in service hauling their products from Columbus to points in the Middle West.

FORCUM & Lammon Const. Co., Dyersburg, Tenn., have purchased a 1-yd Insley with 60 ft boom and 6-71 GMC diesel from Chiles Tractor and Machinery Co., Springfield, Mo.

Tip on Air Systems

The importance of a diesel engine's air system is as vital to efficient performance as any other maintenance and operation procedure. An insufficient amount of air may result in poor combustion, fuel waste, and an overall lack of power and operating efficiency. Improper filtration is another danger area in the air system and may often result in excessive wear of the ring and cylinders. Deposits in the combustion chamber may also be caused by poor filtration.

Autocar Announces New Models

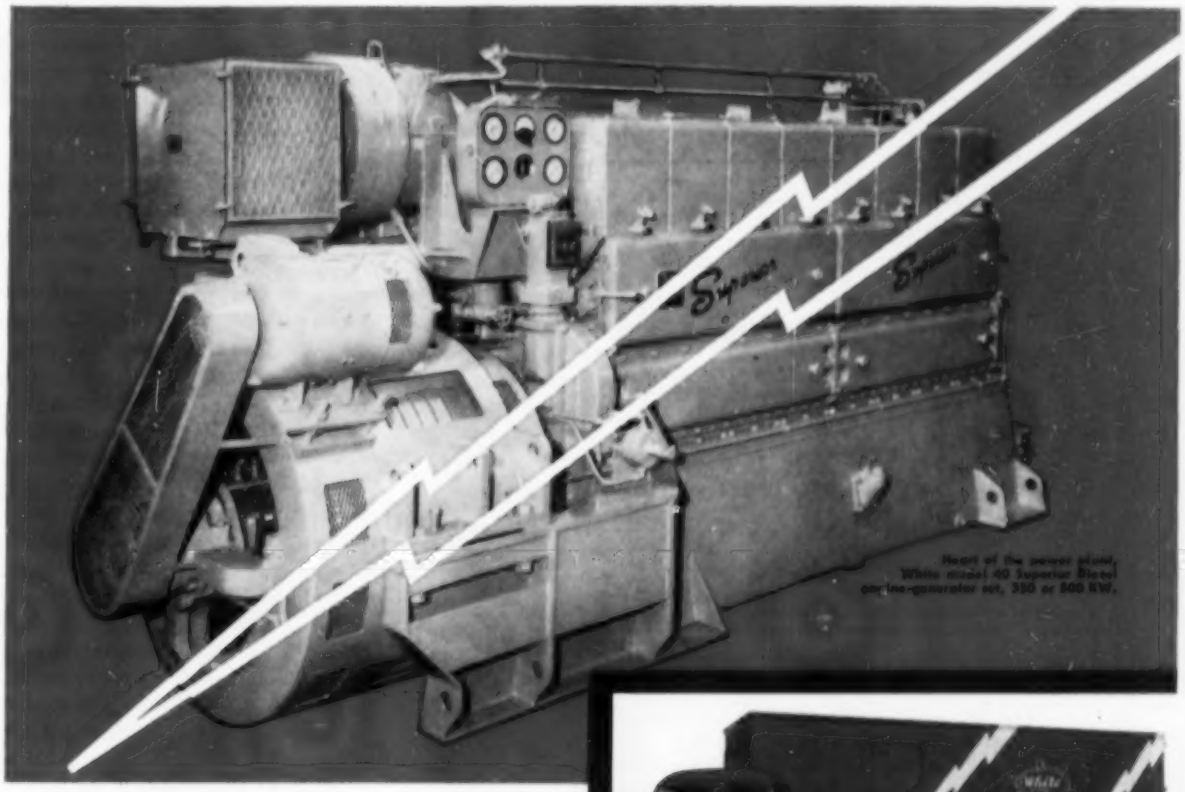
New lightweight models for additional payload advantages have just been announced by Karl A. Roesch, vice-president, Autocar Division of The White Motor Company. These new models, originally developed for the West Coast, have been made available for a variety of heavy-duty applications in all parts of the country, with either axle-forward or axle-back models. Weight saving was accomplished principally by the use of aluminum, retaining the rugged construction which has been so typical of Autocar over the years. The lightweight models—DC-102TL and DC-10264L tandem axle—have all-aluminum driver's cab which features a strong but lightweight aluminum skin over a girder-type frame of aluminum alloy. Formed channels are heli-arc welded. The aluminum skin is riveted to the frame, using an aircraft production technique. This construction permits flexibility and stress absorption without danger of cracks and accomplishes a weight savings of 20% in the cab structure.

Aluminum is employed in various parts of the engine, in the chassis cross-members, transmission case and cover, fuel tank, front and rear axle hubs, hood and front bumper. Many of these parts are of all-aluminum castings or weldments.

Even the wheels are of forged aluminum. Built primarily for highway applications where there is marked payload advantage, these new Autocars have outstanding power characteristics for the extra-heavy payloads. Engines used are HRB Cummins Lightweight—165 hp, HRFB—180 hp, NHB—200 hp, or NT—250 hp diesels.

The battle of the cycles which at one time lent zest to diesel selling techniques is gone and forgotten like the little men whose selling ability was reckoned in terms of his capacity to discredit competitors' products.

NOW! for emergency, supplementary or base power . . . in a hurry!



Heart of the power plant, White diesel 40 Superior Diesel engine-generator set, 350 or 500 KW.

White 3000 tilt-a-cab tractor and trailer hauls power plant over highways as semi-trailer.

send a WHITE DIESEL MOBILE GENERATOR PLANT anywhere...anytime!

White's new mobile generator plant . . . *a powerhouse on wheels* . . . provides highly maneuverable, trouble-shooting electric power to restore power quickly in flood, fire, storm and other disaster emergencies! It is also especially designed to provide dependable standby or supplementary power for industry, hospitals, utilities and municipalities during temporary or seasonal situations; and for use in construction and mining projects where power may be required.

The heart of the unit, a compact, high output, White Model 40 Superior Diesel engine and a 350 or 500 kilowatt capacity generator is built into a trailer which is hauled wherever needed by a White 3000 Series tilt-a-cab tractor. The unit is completely self-sufficient, and one man can operate it at a single control panel. Full load power is supplied immediately, as soon as the necessary connections are made. All components are time-proven, standard production items.

Superior Engines · Atlas Imperial Diesel Engines · White Diesel

Write for complete information.

White Diesel

WHITE DIESEL ENGINE DIVISION

THE WHITE MOTOR COMPANY Plant and General Offices, Springfield, Ohio

DIESEL ENGINE CATALOG

The purpose of this little advertisement is to tell you about Volume 21 of DIESEL ENGINE CATALOG which is now available, entirely revised and rewritten. This is the 21st edition of the book that has earned the name of "the bible of the industry."

All smart diesel engine salesmen carry this book around in their car. When they run into some new competition with which they are not too familiar, the DIESEL ENGINE CATALOG gives them full, accurate information when they need it most.

The consulting engineer keeps this book in his reference file. It immediately gives him *all* data on diesel engines coming within a given horsepower range, speed range and weight range.

People who sell, people who buy, people who use diesel engines need this new, fully illustrated, up-to-the-minute volume. It has been completely revised and expanded. Orders are now being accepted for this latest edition. Price $10.00 prepaid.

Add California Sales Tax for Delivery in That State

DIESEL PROGRESS
816 NO. LA CIENEGA
LOS ANGELES 46, CALIFORNIA

Gulf Coast Diesel Notes

By **Michael T. Pate**

UNITED SAND & Dredging Company, Brookshire, Texas, has bought through Cummins Sales & Service, Inc., Fort Worth, Texas, a model NHRS-600 Cummins diesel which will be used to power a dredge pump. The diesel is rated at 300 hp.

PORT IRON & Supply Company, Port Arthur, Texas, has bought from Stewart & Stevenson Services, Inc., Houston, two General Motors diesels. A model 3030C, series 71, 60 hp unit will be used to repower a Lorain dragline, and a series 71, model 2030C diesel will repower an Insley dragline.

PROLER STEEL Corporation, Houston, has bought through Big 3 Welding Equipment Company, of Houston, a 400 amp. Lincoln welding generator unit powered by a General Motors series 71, model 3055 diesel. The unit will be used in the corporation's warehouse and plant.

IDECO, DALLAS, has bought from Waukesha Sales & Service, Inc., Houston, three model 6WAKDSU Waukesha diesels, rated at 825 hp each. The diesels will be used to provide primary power for a deep-well drilling rig being equipped by IDECO.

HIGMAN TOWING Company, Orange Texas, has secured from Fairbanks, Morse two model 38D8⅛, 4-cylinder, non-reversing marine diesels, rated 640 hp each.

EDWARDS Transportation Company, Houston, has secured from Stewart & Stevenson Services, Inc., Houston, a 70 hp General Motors diesel, series 71, model 3031C, which will power an oil pump on one of the company's barges.

FARNSWORTH & Chambers Company, Inc., Houston, has bought from Mustang Tractor & Equipment Company, Houston, three Caterpillar diesels, a model D339 rated at 105 hp, a model D318 delivering 92 hp, and a model D311, of 45 hp, all of which will be used in powering a new Madsen Hot-Mix plant for use in the company's operations.

SALT WATER Control, Inc., Houston, has bought two Waukesha diesels, a model 190DLCU rated at 71 hp, and a model 180, rated at 34 hp, to drive salt water disposal pumps. The diesels were furnished by Waukesha Sales & Service, Inc., of Houston.

WARREN PETROLEUM Company, Houston, is having Power Machinery Company of Houston install two series 71, model 6031C General Motors diesels for driving pumps on two of the company's barges. The diesels were sold by Stewart & Stevenson Services, Inc., Houston.

ANDERSON SAND & Gravel Company, Amite, Louisiana, will power an 8-inch Thomas dredge pump with a 300 hp model NRT-6-I Cummins turbodiesel engine, secured from Cummins Sales & Service, Inc., Fort Worth, Texas.

GRAY WOLF Drilling Company, Shreveport, Louisiana, is having Continental Supply Company of Dallas install two 100 kw ac generating sets, each powered by a model 6WAKDU Waukesha diesel, furnished by Waukesha Sales & Service, Inc., Houston.

SABIN PROPELLOR & Marine Service Company, Port Arthur, Texas, has bought from Stewart & Stevenson Services, Inc., Houston, two series 110, model 62206 marine diesels, equipped with 3.75:1 hydraulic reduction and reversing gears, which will be used to power a shrimp boat.

MAGNET COVE Barium Corporation, Houston, has bought through Mustang Tractor & Equipment Company, Houston, a model D337, F series Caterpillar 150 kw diesel generator set, equipped with a Caterpillar constant voltage generator which will be used to power a remote mining area in the company's workings.

BROWN & ROOT, Inc., general contractors of Houston, have bought from Big 3 Welding Equipment Company six 300 amp. Lincoln welding generators, each powered by a series 71, model 2055 two-cylinder General Motors diesel.

DIAMOND ALKALI Company, Deer Park, Texas, has purchased from Big 3 Welding Equipment Company, Houston, two Lincoln welding machines. The 300 amp. generator is powered by a General Motors series 71, model 2055 diesel; the 250 amp. unit is driven by a 4-cylinder model DIX4D Hercules diesel.

IDEAL CEMENT Company, Houston, has installed as standby power in its plant a Caterpillar model D326, F series 100 kw generating unit incorporating as primary drive a Caterpillar diesel. The equipment was furnished by Mustang Tractor & Equipment Company, Houston.

BAUER SMITH Dredging Company, Port Lavaca, Texas, will power its new 60-foot twin screw towboat, the "Clydesdale", with two series 110, model 62206

General Motors diesels, each equipped with 4.5:1 hydraulic reduction and reversing gear. The diesels were secured from Stewart & Stevenson Services, Inc., of Houston.

PIONEER Centrifuging, Limited, Houston, has bought from Waukesha Sales & Service, Inc., of Houston, a model 195-DLCU Waukesha diesel. The 81 hp engine will power one of the company's desanders for drilling rig service.

GLENN W. KING Company, Houston, has purchased from Big 3 Welding Equipment Company, Houston, a 300 amp. Lincoln welding generator powered by a series 71, model 2055 General Motors diesel. The unit is for export.

PALYMER ENGINEERING Company, Hitchcock, Texas, will power a 25-foot plastic boat with a series 71, model 4088 inclined diesel, driving through a 1:1 hydraulic reduction and reversing gear. The diesel was furnished by Stewart & Stevenson Services, Inc., of Houston.

SHARP DRILLING Company, Midland, Texas is having Bethlehem Supply Company, Houston, install three model 6LRDBSU Waukesha diesels as primary power in a new drilling rig. The 368 hp diesels were secured from Waukesha Sales & Service, Inc., Houston.

PENROD DRILLING Company, Shreveport, Louisiana, has bought from Big 3 Welding Equipment Company a 300 amp. Lincoln welding generator driven by a General Motors series 71, model 2055 diesel. The unit will be used for rig equipment maintenance.

McWilliams Dredging Company, New Orleans, Louisiana, will power a new twin screw tug with a matched pair of General Motors series 71 diesels, models 6071A and 6072A, which will drive through 3:1 hydraulic reduction and reversing gears. The diesels are rated 185 hp each.

SALT DOME Production Company, Houston, has secured from Big 3 welding Equipment Company, Houston, a 300 amp. Lincoln welding generator, powered by a series 71, model 2055 General Motors diesel. The unit is for general maintenance work.

PARKER BROS. & Company, Houston, will power a 200 kw ac generator with a model NKDBSU Waukesha diesel, secured from Waukesha Sales & Service, Inc., of Houston. The diesel will be used on one of the company's dredges.

FELIX BRUNAY, Morgan City, Louisiana, has bought a matched pair of General Motors series 71 diesels, models 6071A and 6072A, each rated at 185 hp and equipped with 2:1 hydraulic reduction and reversing gears which will be used to drive a 40-foot twin screw crew boat.

LOFFLAND BROS. Drilling Company, Midland, Texas, has bought a model VLRDBSU Waukesha diesel, rated at 1091 hp. The diesel was secured from Waukesha Sales & Service, Inc., of Houston, through Mid-Continent Supply Company, Fort Worth, Texas.

SOUTHERN PINE Lumber Company, Diboll, Texas, will repower a 15-ton American locomotive with a 120 hp model HRCIP-400 Cummins diesel, furnished by Cummins Sales & Service, Inc., of Fort Worth, Texas.

H. H. NULL, Inc., pipeline contractor of Houston, has secured from Big 3 Welding Equipment Company of Houston two 250 amp. Lincoln welding generators, each driven by a model DIX4D four-cylinder Hercules diesel.

SUPERIOR IRON Works, Houston, is installing a model 6WAKDBU Waukesha diesel, rated at 212 hp, on a drilling rig for auxiliary power. The diesel was furnished by Waukesha Sales & Service, Inc., of Houston.

Sales Office

The Trane Company, manufacturing engineers of air conditioning, refrigeration, heating, ventilating and heat transfer equipment, has announced that Mr. Gary Mays was appointed sales representative in charge of a new sales sub-office in Albuquerque, New Mexico. The sub-office of the Trane Denver, Colorado, sales office is located at 3217 Silver Street SE. Telephone number is 6-0391.

Mays received a bachelor's degree in business administration from West Texas State College and graduated from The Trane Company student training program. Previous to his Albuquerque appointment, Mays was a sales representative with the Trane Denver sales office. His military duty included two years in the armored division of the U. S. Army as communications chief.

Series-Parallel Switches

Its new line of heavy-duty, series-parallel switches, in both 12 and 24 volts, is illustrated and described in a new catalog sheet, just released by the Leece-Neville Company, Cleveland. The switches made possible the use of 24 volts for the starting motors on vehicles and engines having 12-volt electrical systems. They are applicable to trucks, busses, tractors and other off-highway equipment, and industrial, marine and railroad engines with cranking motors up to 30 hp and generating systems up to 180 amperes.

According to the company, a single unit L-N Series-Parallel Switch replaces two switches in the usual series-parallel system with Bendix drive. The free literature is illustrated with engineering drawings showing the actual operation of the switch, together with sketches which accompany detailed specifications. Other sections are devoted to product features, applications, and detailed descriptions. Copies may be obtained from the Leece-Neville Company, 1374 East 51st Street, Cleveland 3, Ohio.

ITS NEW

Locomotives Purchased

Railroads in Chile and Brazil have signed contracts with the International General Electric Company for a total of $9,000,000 in locomotives. As part of a $4,000,000 order, the Chilean State Railways has bought the first locomotives of a new universal line recently developed by General Electric's Locomotive and Car Equipment department for use on foreign railroads. Eleven of these universal units, narrow (38⅝-in.) gage and developing 900 hp, have been ordered. The rest of the Chilean railroad's order includes five wide (66-in.) gage diesel-electric locomotives developing 1,600 hp and 15 wide (66-in.) gage units of 720 hp.

This is the second large order this railroad has placed through the International General Electric Company. Delivery will begin in about seven months. In its contracts Brazil's Santos A. Jundiai Railway has ordered 45 wide (63-in.) gage, 70 ton, 720 hp diesel-electric locomotives to cost $5,000,000. Delivery will begin this fall.

Ultra Modern
High Output
Less Weight Per HP
Low Piston Speed
Low Fuel Consumption
Low Noise Level
Positive Reverse
One Lever Control

A NEW Kahlenberg
TURBOCHARGED DIESEL
POWERS THE "SANDRA MARIE"

- Quiet Running—Outstandingly Smooth
- Flexible and Fast Handling
- Direct Drive and Direct Reversible
- Conservatively Rated and Economical
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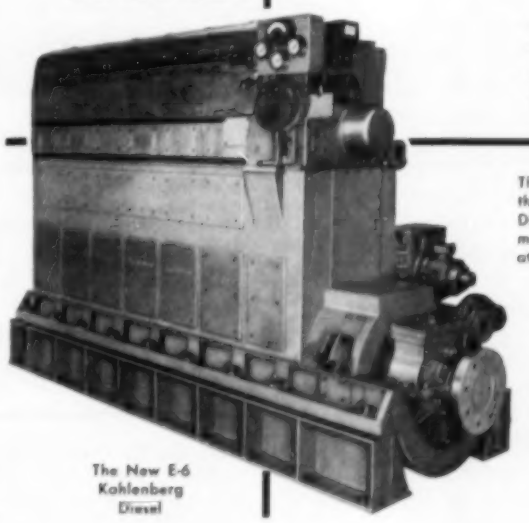
- Neat and Compact



The New E-6 Kahlenberg Diesel

The features enumerated above are only a few of the many outstanding details of the new and ultramodern Model E Series Kahlenberg high output turbocharged Diesels—The ONLY turbocharged two stroke Diesels available in America that start, maneuver, run dead slow or full speed without any blower, scavenge pump or other attached or unattached aid to the turbocharger.

Kahlenberg Model E Series Diesels are offered for marine or stationary service in units to eight cylinders rated up to 1100 SHP and 300 to 400 RPM rated speed range.

KAHLENBERG BROS. CO.
1200-1300 Twelfth Street, Two Rivers, Wisconsin

MANUFACTURERS OF KAHLENBERG DIESELS, AIRHORNS, PROPELLERS, AUXILIARIES

Mid-Continent Diesel News

By Jack F. Cozier

GILLETTE MOTOR Transport, Inc., Dallas, Tex., has added since May of this year 26 White 9000 series tractors powered by Cummins NHB-600 diesel engines to the Gillette over-the-road fleet. Gillette in cooperation with two other freight lines now offers thru trailer service to the East and West coasts.

UNITED GEOPHYSICAL Co., Tulsa, Okla., purchased a Cat D7 tractor with angle dozer and a Hyster winch from McCormick Machinery Co., Tulsa, Okla. The unit will be used for oil field surveying.

CREIGHTON DRILLING Co., Tulsa, Okla., is repowering a Continental drilling rig with two GM 12103 diesel engines for use in Oklahoma. The engines were sold by Diesel Power Co., Tulsa.

OFUSKEE COUNTY, Okemah, Okla., has purchased an Allis-Chalmers HD-11 tractor and Tractomotive ripper from the Boardman Co., Tulsa, Okla. The unit will be used for road maintenance and road building.

LAYMAN & SONS Construction Co., Tulsa, Okla., bought a Euclid S7 overhung scraper for toll road construction. The unit powered with a 4-71 GM diesel engine was sold by Butler-Sparks Equipment Co., Tulsa.

SID BERRY Construction Co., Muskogee, Okla., received a Hough HHD Payloader with a Hercules diesel engine as the power unit. The Clarence L. Boyd Co., Tulsa, Okla., sold the unit which will be used for excavation work.

SAWALLICK Construction Co., Elk City, Okla., purchased a Unit 1014 rubber tired crane powered by a GM 2-71 diesel engine for general construction work. The sale was made by Midwestern Engine & Equipment Co., Tulsa, Okla.

ST. LOUIS-San Francisco Railway Co., St. Louis, Mo., has bought six Fairbanks-Morse model 45C4 ⅛ generating sets. The units have a capacity of 10½ hp each.

PUBLIC SERVICE Co., Tulsa, Okla., has received three DW15 Cat tractors and scrappers from McCormick Machinery Co., Tulsa. The units will be used for supply and expansion work.

SIMS CONSTRUCTION Co., McAlester, Okla., bought a Cleveland model 140 ditcher utilizing an International UD-350 diesel engine as power for use in the State of Missouri. The sale was made by Leland Equipment Co., Tulsa, Okla.

MACK C. COLT, water-flood operator, Iola, Kan., is having constructed a combination well treating unit powered by the first GM 6-71 turbocharged power unit delivered in the United States. The engine was sold by the Diesel Power Co., Tulsa, Okla.

TOM KING Concrete Co., Bartlesville, Okla., purchased a Trojan front-end loader powered by a Hercules diesel engine from Butler-Sparks Equipment Co., Tulsa, Okla. The loader will be used to charge a portable Ruby Batch concrete plant.

SMITH & ROBINSON, oil field contractors, Borger, Tex., has purchased two Cat D6 tractors with 6S hydraulic bulldozers from the West Texas Equipment Co., Amarillo, Tex.

CARR ROCK Products, Neodesha, Kan., bought a model 4057-C GM diesel Fan-to-Flywheel engine to power a Koehring dumper. The engine was sold by K C Diesel Power Co., North Kansas City, Mo.

R. A. YOUNG & Sons, Inc., Tulsa & Oklahoma City, Okla., has been recently appointed as statewide distributor for Chicago Pneumatic compressors. The compressor line consists of the 125 cu ft model with a Hercules gas engine, the 210 cu ft model with a GM 3-71 diesel engine, the 365 cu ft model with a GM 4-71, the 600 cu ft model with a 6-71 GM diesel and the 900 cu ft model with a model 6110 GM diesel.

BROWNFIELD, Texas, has awarded the Nordberg Mfg. Co., Dallas, Tex., the contract for supplying a 10-cylinder TSGL-2110-31 dual-fuel generating unit, rated 4630 hp at 3312 ft altitude.

ROGERS IRON Works, Joplin, Mo., is powering a Rogers jaw crusher with a GM 3031-C diesel power unit with 1:76.1 reduction from K C Diesel Power Co., North Kansas City, Mo.

LLOYD INGRAM, Henrietta, Okla, has bought an Allis-Chalmers HD-6 tractor and bulldozer with a Tractomotive hydraulic-controlled ripper for building

KATO

CONTINUOUS A.C. AND STANDBY

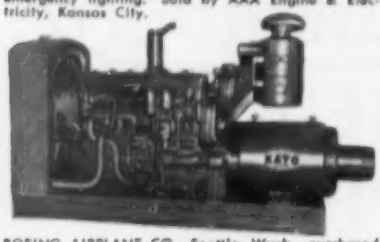
GENERATORS

ARE ADAPTABLE TO ALL MAKES OF ENGINES...

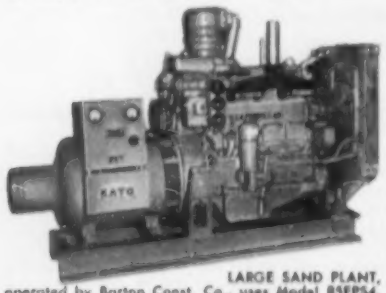
SIZES TO FIT ANY NEED UP TO 500 KVA

Three illustrations of recent Diesel-powered KATO Installations:

U.S. AIRFORCE BASE, Grandview, Mo. uses 75-KW, 93.8 KVA, 120/240V., 60 cycle, single phase, 1800 RPM KATO Generator, driven by P & H Harnischfeger Model 487-18 diesel engine, for emergency lighting. Sold by AAA Engine & Electricity, Kansas City.



BOEING AIRPLANE CO., Seattle, Wash., purchased 175 KW, 219 KVA, 3 phase, 3 wire, 60 cycle, 1800 RPM, revolving field type KATO Generator, General Motors Model 6240J-8A diesel engine. Installed by Star Machinery Company, Seattle.



LARGE SAND PLANT, operated by Barton Const. Co., uses Model 8SEPS4, 150 KW, 187 KVA, 220/440V., 3 phase, 60 cycle, 1800 RPM, 2 bearing, close coupled type KATO Generator adapted to No. 0 bell-housing on Caterpillar D337 diesel engine. Sold by Wm. H. Ziegler Co., Minneapolis.

WRITE

Builders of Fine Electrical Machinery Since 1928

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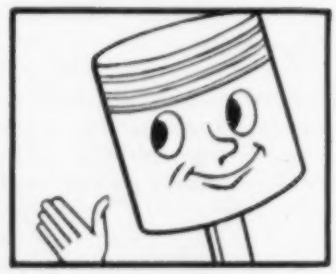
CEMENT SHEATHS guard gulf wells



by Cecil Diesel

ROVING REPORTER

PORT OF NEW ORLEANS—"What kind of ship is *this?*" I ask Skipper as the twin 270 HP Caterpillar marine diesels settle down to work. (I see another pair of Caterpillars, D3-18's, there in the engine room teamed with 40 KW generators.)

"This is one of the fleet of seagoing Halliburton cementing ships," he says. "Our deck tanks are filled with cementing materials. We're headed for some offshore oil drilling rigs, where we'll protect well casings with sheaths of cement. Pump it down as a liquid with power from three Cummins NHRBS 600 diesels.

"For starting . . ." he goes on, "we've got two D-340 Quincy compressors — one forward, one in the engine room. Use them to operate cement discharge valves and air-over-hydraulic controls for the ship itself, too!"

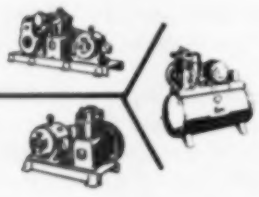
Quincy has a compressor for your diesel starting job, too. Let them help you select the right model from a range of mountings and sizes — from 1 to 90 CFM. Write them for a catalog today.

Quincy COMPRESSORS

QUINCY COMPRESSOR CO.

DEPT. K-52, QUINCY, ILLINOIS

World's finest air compressors.



ponds and small construction work. The sale was made by the Boardman Co., Tulsa, Okla.

STANOLIND OIL & Gas Co., County Line, Okla., has purchased three additional LeRoi L-3000 natural gas engines driving three Peerless 1200 ft deep-well turbine pumps from Carson Machine & Supply Co., Tulsa, Okla. The units will be used for water flood operations.

LYLES BUCKNER Construction Co., Muskogee, Okla., received a Cat 955 Traxcavator from McCormick Machinery Co., Tulsa, Okla. The unit will be used for handling material on their concrete work.

VAPOR INTERNATIONAL Corp., Ltd., Chicago, Ill., bought 15 Fairbanks-Morse model 45B4 1/8 direct current generating sets rated at 10½ hp each.

OKLAHOMA STATE Highway Department, Muskogee, Okla., purchased an Oliver 99 diesel wheel tractor for draw-bar work. The sale was made by Midwestern Engine & Equipment Co., Tulsa, Okla.

MILLER LIPP, Tulsa, Okla., has received a Cat D7 tractor with angle dozer for right-of-way work in Arkansas. The sale was made by McCormick Machinery Co., Tulsa.

C & R TRANSPORT Co., Fort Worth, Tex., has in operation 19 tractors powered with Cummins JT-6-B turbodiesels hauling their petroleum tankers throughout the state of Texas.

WADE LAHR Construction Co., Tulsa, Okla., has bought a model 407 Buckeye ditcher from R. A. Young & Son, Inc., Tulsa. The unit powered by a GM 2-71 diesel engine will be used on a water line project in Denver, Colorado.

CHANDLER Materials Co., Tulsa, Okla., received a Hough Payloader powered with a Hercules diesel engine. Clarence L. Boyd Co., Tulsa, delivered the unit to be used for quarry work.

L. G. HARPER Construction Co., Turley, Okla., has purchased a Cleveland model 140 ditcher with an International 3568 diesel engine for power. The sale was made by Leland Equipment Co., Tulsa, Okla.

LOHMAN-JOHNSON Drilling Co., Wichita, Kan., recently powered a single engine drilling rig with a Cummins VT-12 turbodiesel engine for service in Western Kansas.

POOLE CONSTRUCTION Co., Shawnee, Okla., bought a model 977 Cat Traxcavator from McCormick Machinery Co., Tulsa, Okla., for handling material on the toll road paving.

MR. TRIMMER, Henrietta, Okla., has taken delivery on an Allis-Chalmers HD-6 tractor and bulldozer with a Tractomotive hydraulic-controlled ripper from the Boardman Co., Tulsa, Okla. The unit will be used for building ponds and small construction work.

Petroleum Industry Sales Office

The Petroleum Industry Sales Office of the Allison Division of General Motors is now located in Dallas, Texas, to better serve customers in that part of the country, according to J. A. Lane, Manager, Sales-Contracts-Transmissions Operations. Formerly located in Tulsa, Oklahoma, this office is located at 7146 Westbrook St., Dallas 14, Texas. T. S. McCurdy, Allison Sales Representative, will continue to serve as office head.

Mr. McCurdy was a Captain in the United States Marines, serving as a pilot in the Pacific from 1942 to 1946. Later he attended Tri-State College in Angola, Indiana, where he majored in Business Administration. He came to the Allison Division in June, 1951, as a Service Representative and later as a Service Engineer before taking his present position with the company.

Two New Navy Tankers

The first of two new ocean-going tankers designed to withstand the rigors of Arctic travel have been launched at the Bethlehem Steel Company's Staten Island Yard. Main propulsion for the new vessel, the USNS Alatna (T-AOG 81) and for its sister ship, the USNS Chattahoochee (T-AOG 82) will be provided by two 16-cylinder diesel engines built by Alco Products, Inc. of Schenectady, in its new model 251 series.

The ships are being built by Bethlehem for the Navy's Military Sea Transport Service under a U. S. Maritime Administration contract. They are described as "twin-screw, bulk petroleum products carriers, ice-strengthened." The 3,450 deadweight-ton ships are designed to carry diesel oil, aviation gasoline and motor gasoline on Arctic supply runs for the Department of Defense. They are fabricated with a heavy band of steel encircling the ship at the water line to give limited ice-breaker capabilities.

Order For Locomotives

Rock Island Lines has placed an order for ten diesel locomotives with the Electro-Motive Division of General Motors Corp., La Grange, Illinois, D. B. Jenks, president, announced today. The locomotives are G. P. 9's (general purpose) and can be used in both yard and road service. Each has 1750 hp. Delivery is scheduled for April, 1957. With the addition of the new engines, which are needed to handle increased business, Rock Island's motive power fleet will be increased to 529 diesel units. The Rock Island was completely dieselized in 1953.

Clutch For Small Diesels

A unique type clutch, possessing an exclusive lock-in toggle action, is now offered by Salsbury Corporation, Los Angeles. Called the Tog-O-Loc Clutch, it has a disengagement speed approximately 400-500 rpm lower than engagement speed. The manufacturer describes this as a decided advantage over the ordinary centrifugal clutch, on which pick-up and release speeds are approximately equal: the wide differential allows the engine to idle at a satisfactory speed without slippage at relatively low operating speeds; and provides for a greater load capacity in proportion to clutch weight. Compact and durable, the new Tog-O-Loc Clutch is available for use on a wide variety of gasoline and diesel engines in the 10-50 hp range. A long life of trouble-free performance is claimed by manufacturer due to an extra large friction area and simplified construction. Complete information on the Tog-O-Loc Automatic Clutch can be obtained by writing Salsbury Corporation 1161 E. Florence Ave., Los Angeles 1, Calif. for Bulletin No. 56-D-2. (ITS NEW)

NOW AVAILABLE! The Completely new Volume 21 of **DIESEL ENGINE CATALOG.** This giant, fully illustrated reference book containing complete and detailed engine and accessory sections is bigger, better than ever before. Mail orders are now being filled for this "Bible of the Industry," which has been revised, rewritten and brought up to date completely from cover to cover. Orders are being accepted for this limited edition, which costs $10 postpaid plus California sales tax where applicable. Send checks or company order forms to **DIESEL PROGRESS,** 816 N. La Cienega Blvd., Los Angeles 46, California.

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Models from 40 to 400 h.p. (Series O-4 illustrated; 40-50 h.p., Gas or Diesel).

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You can solve your tough power and steering problems with Harbormaster Outboard Propulsion and Steering Units . . . the complete heavy duty marine power packages. They are quickly and easily installed for immediate use. They are efficient, economical to operate and maintain . . . and they have many special features not found with ordinary marine power, so they are the answer to many tough marine problems.

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Manufactured to Navy specification as to flow, pressure drop, dirt holding capacity, detergent removal, etc.

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75 kw-220/440 Volt-900 rpm
Caterpillar Generating Set
used but in excellent condition.
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WANTED
Man to take charge of a diesel operated electric generating plant in midwest town of 2,000. Write to DIESEL PROGRESS, File No. 518, 816 No. La Cienega Blvd., Los Angeles 46, California.

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FAIRBANKS-MORSE, 80 HP, 120 HP, 240 HP, 360 HP, 450 HP, 600 HP, 1000 HP.
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PARTS: Pistons, Cylinders, Crankshafts, Nozzles, Pumps, Flywheels, etc.
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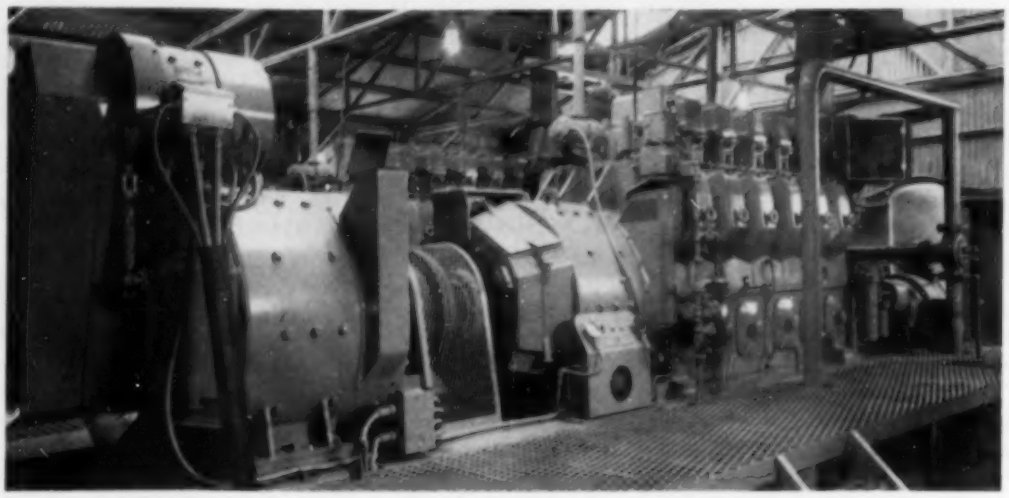
Drilling Rig Power Packages



A typical power unit for an Alco drilling rig power package. The diesel engines are Alco's new 6-cylinder model 251-B, which develop 850 hp at 1000 rpm.

Drilling rig power units built by Alco Products, Inc. are proving themselves in service in the Gulf Coast oil fields. Four Alco power packages have been in service, one for more than a year, and have provided continuous motive power for drilling without a single failure. Two units are operated by the Offshore Company of Baton Rouge, La., one by the Shoreline Drilling Company of New Orleans and the other by the Bateman Drilling Company of New Orleans.

The Bateman power package studded its first hole July 12, 1955 and already has drilled seven wells to a total of 70,855 ft, including three of the directional type totaling 28,389 ft. The first six of these were completed in 86½ days of actual drilling time. The first Offshore package from Alco began powering drilling operations about March 1 of this year and early in June completed its second hole. The first Shoreline package was delivered in mid-January and by June 1 had finished two holes, one to 11,000 and the other to 15,000 ft. In addition to the two-engine Alco power packages now on the job, the company has completed shipment of a three-engine power set to the Delta Offshore Drilling Company of New Orleans, and has scheduled delivery of a three-unit package to Coral Drilling Co. of New Orleans and a third two-unit package to the Offshore Co.

The basic ALCO power package includes two skid-mounted engine-generator sets, a 1370-hp drawworks drive assembly, two 600-hp mud pump drive assemblies and complete electrical controls. Each of the new 6-cylinder ALCO model 251-B diesel engines drives two exciters and main generators, which furnish power for two motors for hoisting and one motor on each mud pump. The main engines also run auxiliary generators which power motor excitation, blower motors and the control system. Equipment and power switching is arranged so that either engine-generator set can very well supply, at full torque, all necessary operations for drilling or hoisting.

Variable-voltage electrical control permits changing motor speeds with a constant engine speed—thus eliminating waiting for engine acceleration. Alco power packages are available with modifications including rotary-table drive, coring-reel drive, and additional engine-generator set, drawworks drive to 2055-hp, mud-mixing pump drive and 1200-hp mud pump drive.

Surface Plate Calibration

"How to Calibrate Surface Plates in your Plant", by J. C. Moody of the Sandia Corporation, is now being made available by Collins Microflat Company—makers of the MICROFLAT Black Granite Surface Plate. This article gives the step-by-step instructions for surface plate calibration after it has been installed in the user's plant. Since measurements are no more reliable than the surface plate on which they are referenced, it is important to know exactly the accuracy of the plate being used. By the use of an auto-collimator and following the manufacturer's instructions, this highly accurate method of calibration can be performed by semi-skilled personnel using instruments available in any industrial laboratory. This article can be ob-

tained from the Collins Microflat Company, free of charge. Address is 2326 E. 8th Street, Los Angeles 21, California. ITS NEW

Mansfield To LeTourneau

LONGVIEW, TEXAS– Albert E. Mansfield, Jr. has been named midwestern representative for the Industrial Equipment Division of R. G. LeTourneau, Inc., Mansfield previously was branch manager for Continental Motors Corporation at Greggton, Texas, and also was supervisor of maintenance for Brown Express Company at Dallas and San Antonio. Prior to that he was connected with the trucking industry in fleet maintenance and sales work in the Chicago, Ill., area for 16 years. Primarily, the Industrial Equipment Division markets hoists and jib cranes.

Albert E. Mansfield

Down in Miami, construction companies often take to the sea to get a job done. This little tug–"Badger"–is a real veteran. It has towed construction barges for the Ebsary Foundation Company, of Miami, Florida, for over 13 years. During this time, its 150 horsepower HM-600 Cummins diesel, has logged over 22,000 hours of dependable service. The tug swings a 36" x 24" propellor through a 3 to 1 reduction gear.

Recently repowered by a three-cylinder diesel engine, this eight-ton Plymouth yard locomotive–a midget in comparison to one of the cars it moves–is today doing a giant's measure of work for Julius Porath and Son Co., concrete suppliers of Detroit. Handling as many as 12 cars at a time, this lightweight "Dinkie" shuttles incoming shipments of gravel from a railroad siding to the company's ready-mix plant. The new engine is a Detroit diesel unit of 102 hp supplied by Peninsular Diesel, Inc. of Detroit. Power is transmitted through an Allison Torqmatic converter which provides the smoothness of steam in starting heavy loads. The diesel replaced a gasoline engine and was mounted on the unit's existing frame, with only minor body alterations required in making the changeover.

Reinforced concrete no problem–Ripping out 8-in. concrete laced with steel reinforcing rods, this International Drott TD-14 Skid-Shovel makes short work of a 150-cu yd concrete excavation project at a gas station in Camden, N. J. Owner, A. J. Pangia of the Pangia Construction Company, White Horse Pike, Atco, N. J., claims his TD-14 will rip out concrete footings and slabs a ¾-cu yd shovel couldn't touch. He further reports 2,000 hours of concrete work with only minor break-downs. The unit with its 17,000 pounds "break-out" force provides fast and economical operation.

Payne Advances

Dr. Robert E. Payne

Dr. Robert E. Payne has been named Director of Research for the Sharples Corporation, Centrifugal and Process Engineers, Philadelphia, Pennsylvania. In addition to his duties as Director of Research, Dr. Payne will also serve as Technical Advisor on production of centrifugal equipment manufactured by the Philadelphia corporation for use in the chemical, oil marine, food and other process industries. Dr. Payne, who received his Ph.D. in Physics from the University of Texas, first became associated with the Sharples Research Laboratories, a Division of Sharples, in 1945. Until 1949 he was a Senior Staff Physicist on A.E.C. and Industrial Research.

Newest addition to the Puget Sound Tug and Barge Company fleet at Seattle, Washington is the TROJAN, a 65-foot steel hull craft now operating 24 hours a day in Seattle Harbor and Puget Sound. Like her sister ship the TITAN, put in service in 1954, the craft is powered by a Detroit diesel 6-71 quad unit. At approximately 1800 engine rpm the craft has 600 continuous horsepower available at the shaft. The TROJAN was commissioned by the Marine Construction and Design Company of Seattle. Evans Engine and Equipment Co., Inc., also of Seattle, supplied the quad unit.

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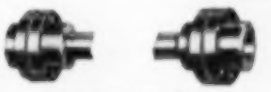

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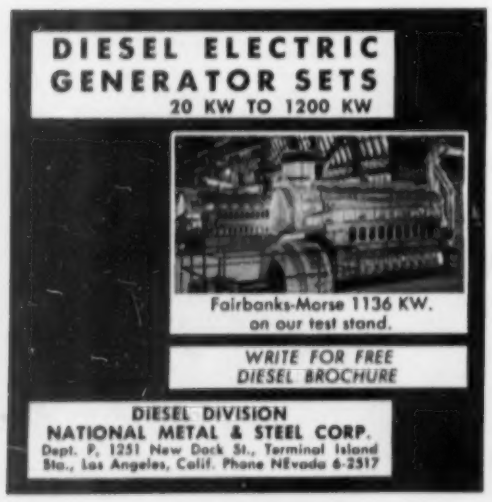

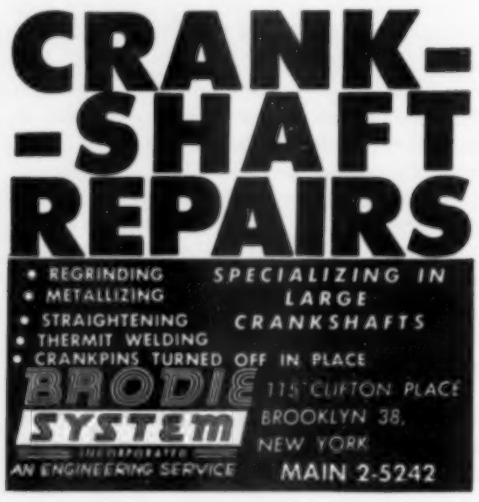

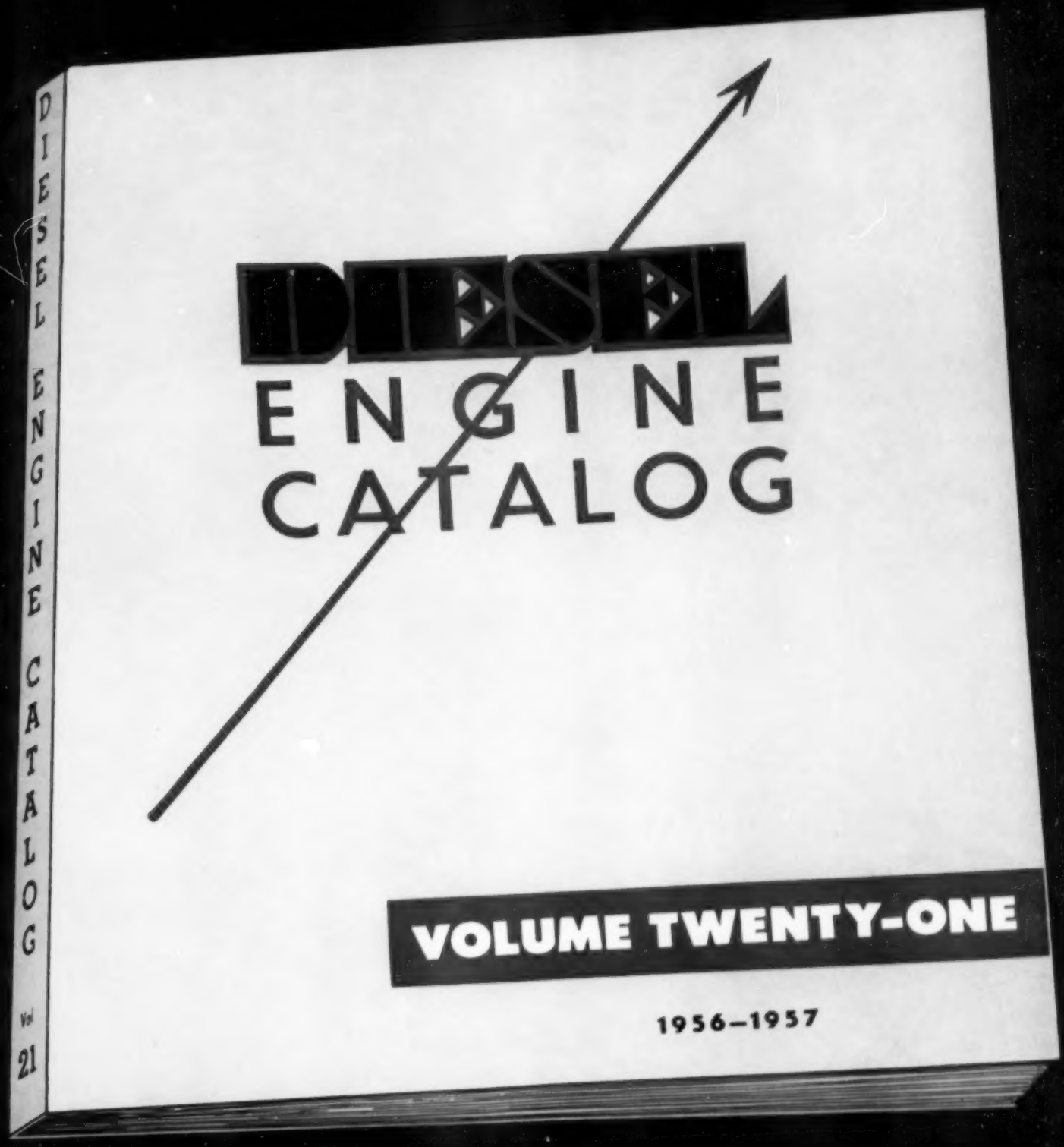

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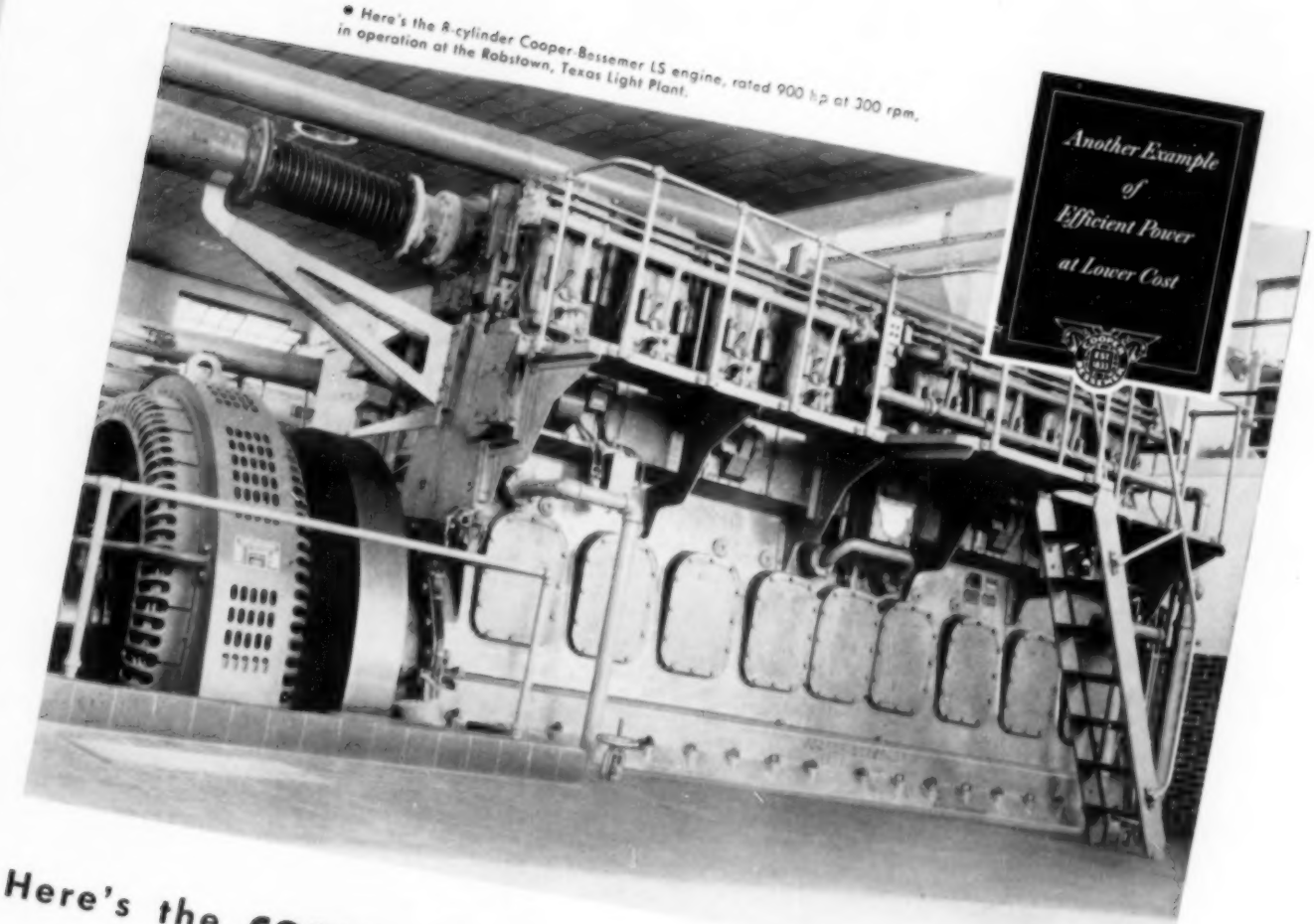

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